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ABSTRACT

This volume of student materials for a secondary/post-secondary level course in food service/baking comprises one of a number of military-developed curriculum packages selected for adaptation to vocational instruction and curriculum development in a civilian setting. The purpose stated for the individualized, self-paced course is to assist the apprentice (semi-skilled) baker in his/her duties as assistant to the baker. The course is recommended for use in providing supplemental study for students in baking or food services programs. Four chapters cover these topics: safety (accident and fire prevention, shop and electrical safety), sanitation and personal hygiene (food service standards, communicable diseases, disease control measures, cleaning agents, insect and rodent control, sanitizing supplies, storage of cleaning supplies), baking fundamentals and production of pastry (baking terms, function of baking ingredients, cakes, cookies, pie dough and filling, yeast dough), and Air Force Supply discipline (procedures for inspecting food supplies and storing foods). Each chapter is organized around criterion learning objectives that are accompanied by reading assignments and criterion test items with answers. A course examination is provided, but no answers are available. (YLB)

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MILITARY CURRICULUM MATERIALS

The military-developed curriculum materials in this course package were selected by the National Center for Research in Vocational Education Military Curriculum Project for dissemination to the six regional Curriculum Coordination Centers and other instructional materials agencies. The purpose of disseminating these courses was to make curriculum materials developed by the military more accessible to vocational educators in the civilian setting.

The course materials were acquired, evaluated by project staff and practitioners in the field, and prepared for dissemination. Materials which were specific to the military were deleted, copyrighted materials were either omitted or approval for their use was obtained. These course packages contain curriculum resource materials which can be adapted to support vocational instruction and curriculum development.

The National Center Mission Statement

The National Center for Research in Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The National Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Installing educational programs and products
- Operating information systems and services
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Military Curriculum Materials for Vocational and Technical Education

Information and Field Services Division

The National Center for Research in Vocational Education

Military Curriculum Materials Dissemination Is . . .

an activity to increase the accessibility of military-developed curriculum materials to vocational and technical educators.

This project, funded by the U.S. Office of Education, includes the identification and acquisition of curriculum materials in print form from the Coast Guard, Air Force, Army, Marine Corps and Navy.

Access to military curriculum materials is provided through a "Joint Memorandum of Understanding" between the U.S. Office of Education and the Department of Defense.

The acquired materials are reviewed by staff and subject matter specialists, and courses deemed applicable to vocational and technical education are selected for dissemination.

The National Center for Research in Vocational Education is the U.S. Office of Education's designated representative to acquire the materials and conduct the project activities.

Project Staff:

Wesley E. Budke, Ph.D., Director
National Center Clearinghouse

Shirley A. Chase, Ph.D.
Project Director

What Materials Are Available?

One hundred twenty courses on microfiche (thirteen in paper form) and descriptions of each have been provided to the vocational Curriculum Coordination Centers and other instructional materials agencies for dissemination.

Course materials include programmed instruction, curriculum outlines, instructor guides, student workbooks and technical manuals.

The 120 courses represent the following sixteen vocational subject areas:

- Agriculture
- Aviation
- Building & Construction Trades
- Clerical Occupations
- Communications
- Drafting
- Electronics
- Engine Mechanics
- Food Service
- Health
- Heating & Air Conditioning
- Machine Shop
- Management & Supervision
- Meteorology & Navigation
- Photography
- Public Service

The number of courses and the subject areas represented will expand as additional materials with application to vocational and technical education are identified and selected for dissemination.

How Can These Materials Be Obtained?

Contact the Curriculum Coordination Center in your region for information on obtaining materials (e.g., availability and cost). They will respond to your request directly or refer you to an instructional materials agency closer to you.

CURRICULUM COORDINATION CENTERS

EAST CENTRAL
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Springfield, IL 62777
217/782-0759

NORTHWEST
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APPRENTICE BAKER

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APPRENTICE BAKER

Correspondence Course 9-1

Developed by:

United States Air Force

Occupational Area:

Food Services

Development and Review Dates:

May 1975

Cost: $2.00

Print Pages: 74

Availability:
Military Curriculum Project, The Center for Vocational Education, 1960 Kenny Rd., Columbus, OH 43210

Suggested Background:

None

Target Audiences:

Grades 10-adult

Organization of Materials:

Learning objectives, text, criterion test items with answers, and volume review exercises

Type of Instruction:

Individualized, self-paced

Type of Materials:			No. of Pages:	Average Completion Time:
Apprentice Baker				
Chapter 2	—	Safety	14	Flexible
Chapter 3	—	Sanitation and Personal Hygiene	17	Flexible
Chapter 4	—	Baking Fundamentals and Production of Pastry	19	Flexible
Chapter 5	—	Air Force Supply Discipline	4	Flexible
Volume Review Exercises			10	

Supplementary Materials Required:

None

The Center for Vocational Education, The Ohio State University

Expires July 1, 1978

Course Description:

This one-volume course is designed to assist the Apprentice (semi-skilled) Baker in his/her duties as assistant to the baker whose responsibilities are:

- Mix doughs and batters
- Ferment and proof dough
- Form doughs and batters for baking
- Bake products
- Ice and decorate pastries
- Operate and maintain equipment

This course contains five chapters. The first chapter on the career field and part of the last chapter on Air Force supply have been deleted because of references to specific military operations and procedures.

Chapter 2 – *Safety* discusses accident prevention, shop safety, fire prevention, and electrical safety.

Chapter 3 – *Sanitation and Personal Hygiene* explains food service standards, personal hygiene, communicable diseases, disease control measures, cleaning agents, general sanitation measures, insect and rodent control, sanitizing supplies and storage of cleaning supplies.

Chapter 4 – *Baking Fundamentals and Production of Pastry* covers baking terms, the function of baking ingredients, cakes, cookies, pie dough and filling, and yeast dough.

Chapter 5 – *Air Force Supply Discipline* discusses procedures for inspecting food supplies and storing food. The section on accounting procedures was deleted because it referred to military forms and procedures.

Each chapter is built around a series of criterion learning objectives which are accompanied by reading assignments and criterion test items. The answers are provided for student self-study and evaluation. A course examination is available but no answers are provided. This course would serve well as supplemental study for students in baking or food services programs.

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CDC 62130

APPRENTICE BAKER

(AFSC 62130)

Volume 1

Extension Course Institute

Air University

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Preface

THIS VOLUME is written to aid you in learning as much as possible about your work. The material in this course is based on the Specialty Training Standard for AFSCs 62130/50/70 and contains some material on AFSC 62291. This course, along with your job proficiency training, is designed to teach you what you must know for advancement to a higher skill level. Since this is a self-study course the primary responsibility for studying, learning, and advancing to a higher skill level, rests with you, the student. Your effort and demonstrated ability will determine if you will progress to a higher skill level, and qualify for greater responsibility and authority. More important to you, however, is that advancement in skill means elegibility for advancement in rank.

This volume covers the functions, responsibilities, and opportunities of the career ladder and shows the relationship of the baking operation to other food service operations. It represents the Air Force Food Service Management Program as well as the reference manuals that pertain to the bakery. It also covers the training and supervision you will come into contact with in your Air Force career.

This volume also covers food service sanitation standards, personal hygiene, disease control measures, and the all important subject of safety.

We will discuss baking fundamentals, production of pastry, and accounting procedures involved with Air Force baking.

In Chapter 1, you will be given information on communications security. As a member of the Air Force, or of any branch of the Armed Forces of the United States, it is your job to practice the security required to safeguard our country's freedom.

If you have questions on the accuracy or currency of the subject matter of this text, or recommendations for its improvement, send them to Tech Tng Cen/TTOX, Lowry AFB CO 80230. NOTE: Do not use the suggestion program to submit corrections for typographical or other errors.

If you have questions on course enrollment or administration, or on any of ECI's instructional aids (Your Key to Career Development, Behavioral Objective Exercises, Volume Review Exercise, and Course Examination), consult your education officer, training officer, or NCO, as appropriate. If he can't answer your questions, send them to ECI, Gunter AFS AL 36118, preferably on ECI Form 17, Student Request for Assistance.

This volume is valued at 15 hours (5 points).

Material in this volume is technically accurate, adequate, and current as of May 1975.

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MODIFICATIONS

Pages 1-17 of this publication has (have) been deleted in adapting this material for inclusion in the "Trial Implementation of a Model System to Provide Military Curriculum Materials for Use in Vocational and Technical Education." Deleted material involves extensive use of military forms, procedures, systems, etc. and was not considered appropriate for use in vocational and technical education.

CHAPTER 2

Safety

ACCIDENT PREVENTION is a function of management. Commanders at all levels are directed to have a continuing and aggressive accident prevention program designed to reduce ground accidents to a minimum. Each Air Force commander, supervisor, and airman is responsible for the effectiveness of the ground safety program. In order to accomplish this goal, each member of the Air Force should be aware of the safety program and strive to keep accidents to a minimum. Effective operation of the ground safety program requires the cooperation and support of all Air Force members. This is *YOU*!

2-1. Accident Prevention

What is accident prevention? Is this something new to me? If you are aksing yourself these questions, let's clear up your doubts. You have been practicing accident prevention for at least 15 years. Does that surprise you? When you were 5 years old and touched that hot stove, did you touch it again? I don't think so. The next time you were around that stove, you were quite cautious, weren't you? Even at the early age of 5 you were practicing accident prevention. You learned by your own experiences. When we will do in this chapter is give you some ideas for accident prevention and let you learn from other peoples' experiences.

011. List the basic causes of accidents.

Accidents do not happen without cause. The identifications, isolation, and control of these causes are the underlying principles of all accident prevention techniques. Even natural elements can be controlled to some extent; it is only in the realm of nature involving things such as lightning, storms, earthquakes, or floods that accidents are extremely hard to prevent. However, even these can be held to a minimum if the right precautions are taken. Lightning rods, boarding your house up prior to a hurricane, digging rivers and streams deeper to prevent flooding, and many more preventive measures can be taken to keep accidents to a minimum.

Theoretically, preventable accidents may be traced to factors in the heredity and early environment of individuals. These beginnings may further be said to show themselves in unsafe personal characteristics which allow an individual to perform an *unsafe act* or overlook or tolerate an *unsafe condition* which may result in an accident. Remember touching the stove? This is a good example of an *unsafe act*. Or when your parents scolded you for playing in the street? This is an example of your parents *not* tolerating an *unsafe condition*. The detection and elimination of unsafe personal characteristics (such as inattentiveness, excitability, impatience, and stubbornness) are normally extremely difficult. On the other hand, the elimination of unsafe acts and conditions is a relatively simple and effective means of accident prevention.

Exercise (011):

1. What are the two basic causes of accidents?

012. Identify shop safety practices you employ when working around machinery.

Although dining halls and bakeries are not considered high-risk areas, there are numerous hazards to which personnel are exposed. These include sharp handtools, specialized machinery, hot materials, and water on the floor. The use of unskilled workers as kitchen or bakery help increases the hazard of unsafe acts, calling for constant and alert supervision. An effective approach to this supervision is proper worker instructions; thus, safety training regarding the hazards involved in different dining and bakery operations is essential and should be conducted continuously. Additional information is found in AFR 127-101, *Accident Prevention Handbook*.

All electric machinery should be properly grounded (see fig. 2-1). Wet floors increase the

PORTABLE TOOLS

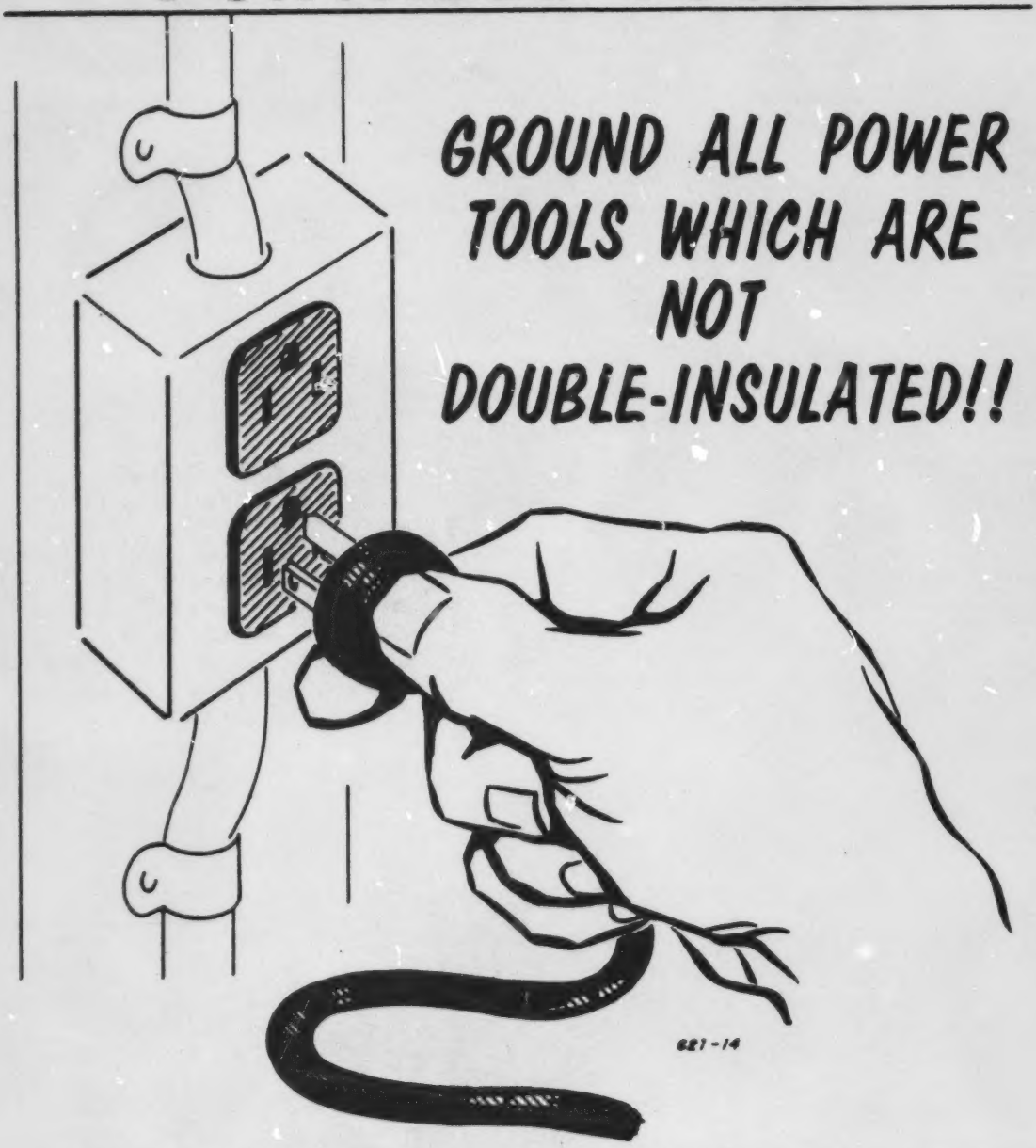


Figure 2-1. Grounding tools.

IF TOOL IS EQUIPPED WITH A THREE-PRONG PLUG, IT SHOULD BE PLUGGED INTO A THREE-HOLE ELECTRICAL RECEPTACLE. IF ADAPTER IS USED TO ACCOMODATE TWO-PRONG RECEPTACLES, THE ADAPTER WIRE MUST BE ATTACHED TO A KNOWN GROUND. NEVER REMOVE THIRD PRONG!!

possibility, and extent of electrical shock to personnel. Wet floors may also mean sliding feet; thus, food service personnel should wear safety shoes (see fig. 2-2). All machinery must be operated according to the manufacturer's instructions. The wearing of bulky clothing, bracelets, rings, and ties are examples of poor safety practices. Such things should be eliminated before operating any machinery.

Only fully-trained, authorized personnel should operate slicing, grinding, mixing, or other food-processing machines. Before letting a new worker operate a machine, give him instructions on the proper method of operation. Be there when he uses the machinery, and correct his mistakes until you feel he is a qualified operator (see figs. 2-3 and 2-4).

Exercise (012):

1. What five safety practices should you comply with when working around and operating machinery?

013. Identify the areas which contribute to most Air Force ground accident fatalities.

Normally, unsafe acts and conditions can be anticipated, readily identified, and eliminated almost immediately upon discovery. Because of this, practical accident-prevention measures are designed to prevent or eliminate direct causes.

Most Air Force ground accident fatalities can be attributed to unsafe operation of motor vehicles. The second largest cause is sports and recreation. The third is domestic-type accidents. Industrial types are the least. As you can see, then, it is quite important to be careful while off duty as well as on duty.

Approximately 20 percent of the Air Force ground-disabling injuries occur on duty, with the remaining 80 percent occurring off duty, mainly sustained in private motor vehicle accidents.

About 83 percent of Air Force ground accidents involve military personnel. Air Force civilians account for about 14 percent, with the remaining 3 percent non-Air Force persons. Now, you may say that this is unjust: there are more military on base than there are civilians. I'm sure that the statistics downtown are probably 95 percent civilian, and about 5 percent military. However, when you look at it like that, you're really in trouble! If you have 83 percent of accidents on base involving military, and 5 percent downtown involving military, where does that put you? Think about it; and when you get behind the wheel, think about it even more. *DON'T BE A STATISTIC!*

Figure 2-2. Safety shoes.

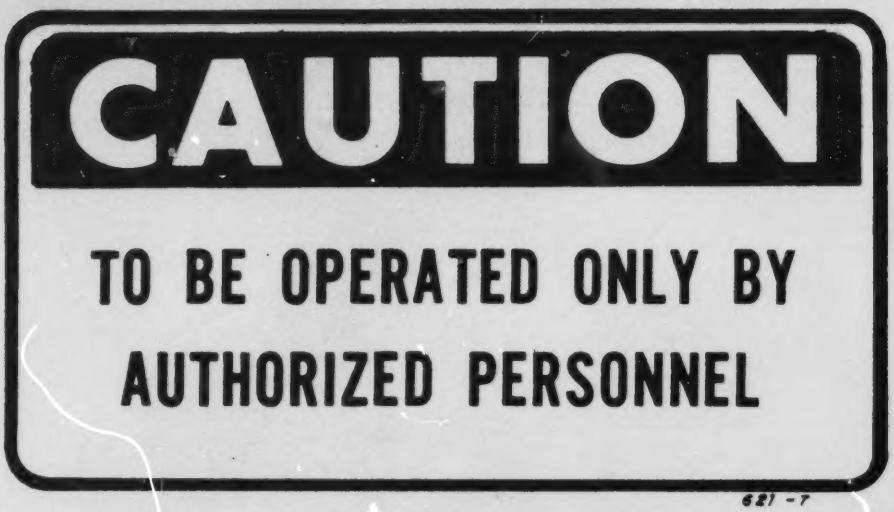


Figure 2-3.

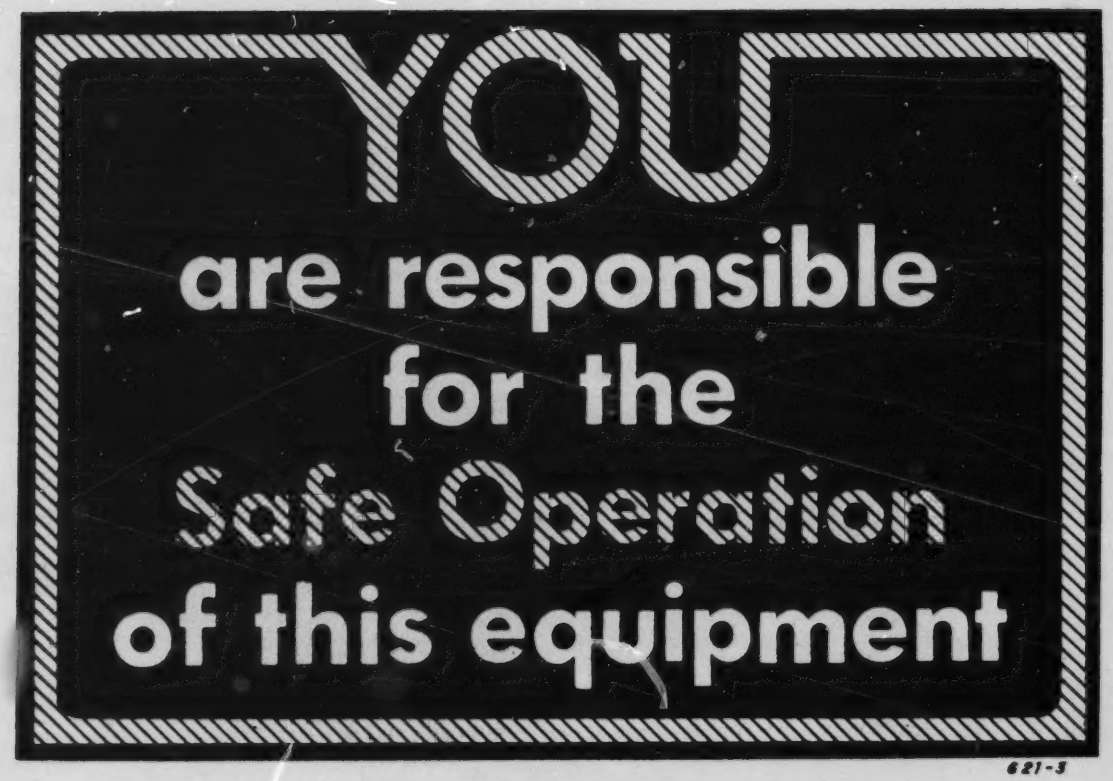


Figure 2-4.

Exercise (013):

1. In what three areas do most Air Force fatalities in ground accidents occur?

2-2. Shop Safety

As we mentioned in the preceding paragraphs, only about 20 percent of the accidents in the Air Force occur during duty hours. However, this 20 percent that you may take lightly is quite enough for you to have a fatal accident. It really sounds morbid, doesn't it? But let's face the facts. Safety is something no one can take lightly. In most military and civilian accidents about nine out of every 10 accidents involve people who take the idea of safety lightly. You cannot take accidents lightly after they happen. Then, it's too late. You must look ahead and make every effort to control unsafe acts and conditions. The price you may have to pay will not be a light one!

Different areas of the bakery require different safety precautions. Common sense tells you that you wouldn't use the same safety measures while mixing cake dough that you would use while stocking shelves. In the following paragraphs, we will look at the various bakery areas and observe safety procedures for each.

014. Identify safety practices that should be taken when working in various areas of the bakery.

Stacking Materials. Stack materials neatly and in easily accessible places. Cross ties, separators, or dunnage should be used to guard against the chance of objects falling. Take extra care when stacking materials; improper stacking could lead to possible injury from falling objects. Never stack materials within 18 inches of ceiling fire sprinkler systems. Stacks more than 15 feet high containing hazardous materials should never be stacked closer to sprinkler heads than 36 inches. Materials should not be stacked in any area where they will protrude into aisles or passageways. This could cause a person to trip and could also be a hazard to fire fighters in an emergency.

Tools. Tools should never be left on overhead platforms, boxes, etc. Always put tools in their proper places after use.

Lighting. A poorly lighted facility is a good breeding place for accidents. All machinery, work benches, aisles, stairways, and rooms should have adequate lighting in order to minimize accidents. Fluorescent lights should be provided with shields or clamps to prevent tubes from falling. These tubes contain harmful gases that could contaminate personnel and food.

Clothing Lockers. Personal clothing lockers should be made of steel or other metal, be adequately ventilated, and kept in a clean and orderly condition. Never place any objects atop or beneath the locker. Any clothing contaminated with flammable substances should not be placed in lockers; spontaneous combustion could cause these clothes to burn. Clothing of this type should be placed in a covered metal container until they can be cleaned or disposed of.

Lunch Facilities. Suitable locations should be provided for those personnel who wish to eat lunch. These locations should be kept clean and orderly. No loose tools or any other objects should be kept in this area.

Exterior of Building. There are some very important safety rules for building exteriors. The following paragraphs cover several of them.

Storage. Materials should not be stored under or piled against buildings, doors, exits, or under stairways.

Weeds. Such plants will not be permitted to grow excessively or to accumulate near buildings, tanks, walkways, or in any personnel or property area. Such growth increases the possibility of fire.

Walks. Walks will be kept clear of obstruction, slipping and tipping hazards, broken glass, snow, ice, or any other debris.

Grease Traps. Grease traps should be cleaned at regular intervals. A dirty grease trap is a possible safety hazard and gives off a very foul odor when it is not cleaned properly.

Smoking. Where smoking is permitted, ash trays or sand-filled containers should be available for disposal of ashes and cigarettes. If there are areas where smoking is not permitted, appropriate signs should be posted at eye level (fig. 2-5).

Spills. Spills are hazards in all areas of operation. Spills rank very high as causes for Air Force accidents. Because of some careless individual another person may pay a heavy price. Whenever a spill of any size or type, such as water or grease, is spotted, it should be cleaned up immediately (see fig. 2-6).

Exercise (014):

1. Never stack materials within _____ inches of ceiling fire sprinkler systems.
2. Tools will never be left on _____ platforms, _____, etc.

Figure 2-5. No smoking sign.

3. Fluorescent lights will be provided with _____ or _____ to prevent tubes from falling.
4. Clothing that has come into contact with flammable substances will be placed in a covered _____ _____ until it can be cleaned or disposed of.
5. In authorized smoking areas _____ _____ or _____ _____ should be available.

015. Identify safety practices to observe when using bakery equipment.

Refrigeration and Cold Storage. All refrigeration systems in dining facilities and food preparation areas that use toxic or flammable refrigerants under pressure of more than 20 pounds are installed and maintained according to the safety code for mechanical refrigeration. Additional safety standards are found in AFR 127-101, however, we will cover some important safety measures that should be taken.

Ventilation. Adequate ventilation should be provided to prevent dangerous concentrations of toxic or flammable gases around refrigeration equipment. Instructions for emergency shutdown of refrigerators and like equipment should be posted outside the compressor room.

Refrigerator doors. All walk-in refrigerators and cold storage rooms should be equipped with at least one door that can be opened from the inside. You must be able to open the door from the inside when it is locked from the outside. When doors must be locked from the outside, signs should be posted on the doors. These signs will state: "DETERMINE THAT NO ONE IS INSIDE BEFORE LOCKING DOOR," in at least 3 inch letters.

Steam Equipment. Steam equipment, like all other equipment, should be operated within the safety limits prescribed by the manufacturer and the Air Force. Kitchen steam equipment, and all system components, should be inspected regularly. Safety valve outlets are piped away from working areas so that steam discharges will not endanger personnel. If the equipment does not have mechanical agitators for stirring contents, wooden sticks or paddles should be used.

Steam valves. Steam kettles should be completely drained of water before steam valves are opened. The valves should be opened slowly to avoid sudden expansion as steam enters the equipment.

Filling. Steam kettles should never be filled to the point that splashing will occur when the contents are stirred. Splash guards should be installed to prevent operators from being scalded.

Steam lines. All exposed steam lines should be covered with asbestos to protect persons against burns caused by accidental contact.

Electrical fixtures. Such fixtures near steam equipment will be vapor-proof types to prevent electrical shocks or short circuits caused by moisture.

Exhausts. Canopy hoods and exhaust systems should be installed over steam equipment to remove cooking vapors. Exhaust hoods should be cleaned frequently to prevent accumulations of flammable greases.

Stoves and Ranges. All stoves and ranges in Air Force dining facilities should be installed according to manufacturers' instructions. They are located away from combustible materials or protected by fire resistant shields.

Lighting. Manufacturers' instructions should be followed when lighting gas-fired ranges. Long tapers should be used to light burners beneath the tops of stoves, and the person doing the lighting

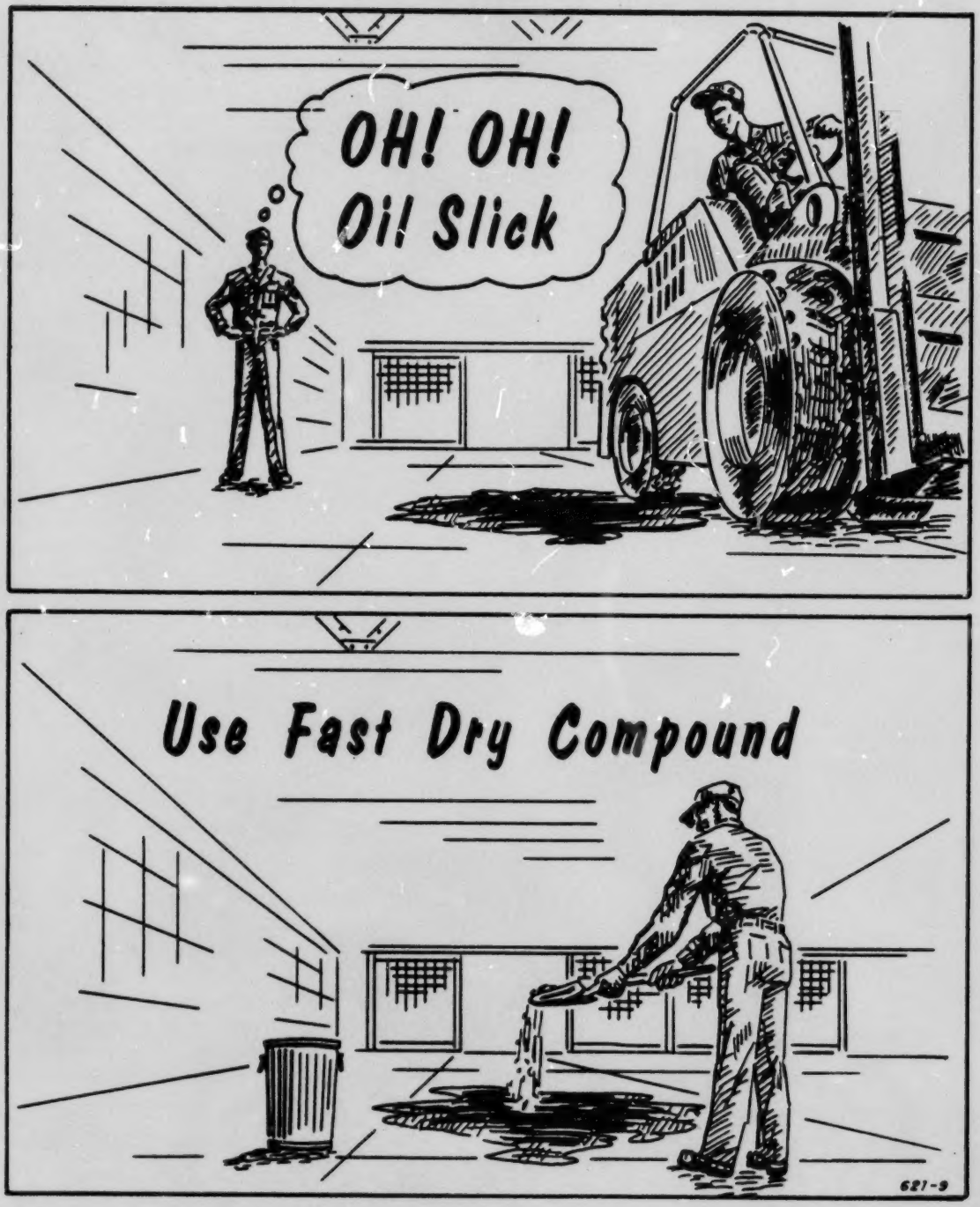


Figure 2-6. Spills.

should stand to one side to avoid flashbacks. Flammable liquids are not to be used to start fires in wood or coal burning equipment.

Cleaning. All stoves and ranges, and their components, are thoroughly cleaned once a week, in addition to required daily cleanups.

Frying chambers. The cooking chambers of deep fat frying equipment should be thoroughly cleaned each day with a noncorrosive fat solvent.

Hoods and vents. Canopy-type hoods and vents should be used over stoves, ranges, and griddles to remove smoke and vapors. Exhaust systems should be fitted with grease traps or filters. Stove hoods are cleaned frequently to prevent buildup of flammable greases.

Exercise (015):

1. Why is adequate ventilation provided around refrigeration equipment?

2. Why are safety valve outlets on steam equipment piped away from working areas?

3. Why are canopy-type hoods and vents used over all stoves, ranges, and griddles?

Lifting. We now come to one of the most violated aspects of safety, the proper method of LIFTING. This rule is probably violated so often because of someone's lack of interest in showing another the proper way. Some of the factors that must be considered when establishing safe lifting limits for all workers are physical differences of personnel, periods of sustained lifting, height of lifting, distance of the load carried, and size and shape of load being carried.

016. Identify the proper methods of lifting, carrying, and depositing objects.

Personnel should not be assigned excessive lifting duties unless a medical examination reveals that they are physically capable of performing these duties. Physical differences make it impractical to set up safe lifting limits for all workers. However, recommended weights, which are considered within the safe limits for male and female workers required to perform continuous or repetitious lifting in compact forms, are 50 pounds for male workers and 25 pounds for female workers. Before an object is lifted, it will be inspected to make sure that no grease or other slippery surface will cause the object to slip. When lifting, the worker first makes certain his footing is secure, and then grasps the object in such a way that it can be held if it becomes unbalanced. The lifter will then lift from a squatting position with his back straight and his legs exerting the primary lifting force, as shown in figs. 2-7 and 2-8).

Gloves will be worn when lifting objects having sharp or burned edges or splintered surfaces.

Carrying. Each load should be carried as close to the body as possible without shifting the grip after the load has been lifted. The carrier will make certain his view of his surroundings is clear and that the floor is free of any foreign items that may cause him to slip.

Two-man carry. Any object that is too heavy for one man to carry comfortably and safely should be carried by two men. If two men cannot safely carry the load, it should be carried by a suitable mechanical device. When two men are carrying an object, they will use oral signals to coordinate their movements. Before starting to carry any material together, the men will decide on an appropriate oral signal to be given if either's grasp should slip or if the load must be released suddenly. Walking in step will make it easier for both men to coordinate their movements and make the carry safely and smoothly.

Long objects. Whenever carrying long objects, you should check to see that your path is clear and your vision will not be obstructed. Also, be careful not to strike other personnel who may be in your way. If an item is too long and possibly too heavy, use the two-man carry and the same precautions as mentioned above.

Depositing. When you deposit the load you have carried, do it in the reverse of the way you lifted the item. Take particular care when releasing the load to prevent possible injury to your hands. On the two-man lift, coordinated release is essential to prevent an accident.

Exercise (016):

1. What is the recommended weight for male and female personnel to safely lift or carry for any length of time?

   Male _____

   Female _____

Figure 2-7. Correct method.

Figure 2-8. Incorrect method

2. What precautions will you take before carrying any long and bulky item?

3. If any object is too heavy for a two-man carry, how should it be lifted and carried?

4. What is the proper way to lift an object of any size which is within the recommended weight limits for the individual lifting that item?

2-3. Fire Prevention

Fire protection, prevention, and control are sometimes thought of as separate from routine accident-prevention activities. There may be some justification for this if we think of fire as it concerns property damage only. However, property damage and personal injury are so closely related that the possibility of injury exists in most accidental fires involving property damate. Since this is the case, the prevention and control of the hazards from fire should be a part of every safety program.

017. Specify what things must be present at the same time to produce and sustain a fire.

When talking about fire prevention there are certain terms you will come into contact with. These are terms such as fire, fuel, heat, flash point, and oxygen. Let us now break these down and give you a better understanding of each.

Fire. This is a chemical reaction between a flammable or combustible substance and oxygen. To produce fire, three things must be present at the same time: fuel, heat, and oxygen. If any one of the three is missing, a fire cannot be started. Likewise, if you remove any one of the three, a fire will be extinguished.

Fuel. This is something that will combine with oxygen in the presence of heat or, in other words, something that will burn. Most ordinary fuels are compounds of carbon and hydrogen in varying amounts, yet even metals, which are not normally considered fuels, can burn in an atmosphere of pure oxygen.

Heat. Most substances will burn only after the solid or liquid fuel is vaporized or decomposed by heat to produce a gas.

Flash point. The temperature at which a substance gives off vapors or gases in a sufficient quantity to be ignited is called the flash point of the substance. Each substance has its own specific flash point. The substance itself will not continue to burn when the source of ignition is removed until it has reached the ignition temperature.

Ignition temperature. This is the minimum temperature required to initiate or cause self-sustained combustion.

Oxygen. Fire normally draws its oxygen from the air, which is a mixture composed roughly of 21 percent oxygen and 78 percent nitrogen. When the oxygen content of the air drops below 16 percent, the fire will usually go out for lack of oxygen. The nitrogen in the air only dilutes the oxygen and does not ordinarily enter into the reaction. In an atmosphere of pure oxygen, many substances not normally considered combustible will burn rapidly. Atmospheres of pure oxygen, or even oxygen-enriched air, will produce fires of great intensity.

Exercise (017):

1. What three things must be present at the same time to cause a fire?

2. What will happen if you remove any one of these three things?

Now that we have covered the concept of what a fire is, let us look at what we can do to help keep fires to a minimum and establish a good and effective fire prevention program.

018. Identify some of the most common fire hazards.

Fire Prevention Principles. Good housekeeping in all Air Force ground operations is essential to effective fire prevention. Accumulations of rubbish, waste, and industrial residue are the most common sources of fire; concentrations of flammable or explosive gases and vapors are other sources of dangerous and destructive fires—fires that are preventable.

Fire Prevention Responsibilities. Although the base fire department, under the supervision of the fire chief, is responsible for fighting fires, inspecting facilities for fire hazards, and enforcing fire regulations, every man on the station shares the fire prevention responsibility. Ground Safety personnel have the added duty of looking for hazardous fire conditions and reporting them to the fire chief.

AFR 92-1, *Fire Protection Program*, gives detailed specifications for handling particularly flammable substances.

Smoking and Open Flames. Smoking or other sources of ignition are prohibited in areas in which a match, flame, spark, or careless disposal of smoking material would constitute a serious hazard. Where complete prohibition of smoking is impractical, designated areas, approved by the fire chief, will be provided. Such areas are clearly marked and separated from hazardous areas.

Signs and receptacles. No Smoking signs should be displayed, and noncombustible disposal receptacles for discarded smoking material provided.

Heating units. Open flame or element space heaters should not be used in any part of a shop where a fire hazard would be created. Under no circumstances are space heaters permitted in locations suspected of having concentrations of flammable or explosive substances.

Burning Rubbish. There will probably never be a need for you, as a baker, to burn rubbish. However, if the need ever arises, you should have some knowledge of the proper and safe way to do it.

When it is necessary to burn small amounts of rubbish, the burning is done in suitable incinerators located at least 50 feet from any building and in an area free of any flammable materials. Incinerators should be equipped with suitable spark arresters to prevent flying sparks or embers from escaping.

Electric Fuses. Only the proper size fuses should be used on electrical circuits, and fuses are never bypassed by jumper wires or any other devices. When fuses are blown, the source of trouble in the circuit will be determined and corrected by a qualified electrician. Fuse pullers will be used to remove or replace fuses on high amp lines.

Spray Paint. As a baker, you will be burdened with a thing called self help. This is just what it sounds like—doing it yourself. Most of the time you'll appreciate this self help, because you can get the job done the way you want it, and probably sooner. In the line of self help, you will find the need to use various types of paint, usually spray paint.

Whenever using spray paint, make sure the area is well ventilated. This is to protect your own health and that of others around you. Spray paint gives off strong fumes that may cause nausea if breathed for extended periods of time. However, spray paint also gives off highly flammable fumes, and can be ignited by the slightest spark. Never smoke while you are using spray paint. Always make sure that spray paints are properly stored. Rags used for wiping up paint or for cleaning brushes should be stored in a metal container with a self-closing lid (see fig. 2-9).

Exercise (018):

1. State the most common fire hazards.

2-4. Electrical Safety

Throughout Air Force ground operations, personnel are exposed to various hazards created by using electrical facilities and electric-powered equipment. The wide use of electrical equipment in Air Force bakeries exposes personnel to many accompanying hazards. Poor judgment in the use of electricity and electrical tools is a major cause of injuries and equipment damage.

019. State safety precautions to observe when working around electrical equipment and identify safety precautions to observe when inspecting equipment.

All electrical equipment and facilities will be continuously inspected to detect and correct any hazards that may have arisen as a result of installation or operation.

Warning Signs. Adequate warning signs will be placed in plain sight in all areas where hazardous electrical facilities exist, particularly around mobile facilities and remote locations (fig. 2-10).

Wiring. All wiring in Air Force ground installations is installed by qualified electricians. All conductors are protected by conduits, armor, or similar safety materials. Makeshift wiring of any kind is prohibited. Just because a conductor is insulated is no guarantee that it is safe—all conductors, including those obviously not connected, will be treated as though they were hot.

Overloading. Overloading electrical circuits is extremely dangerous and never permitted. All Air Force ground installations are equipped with fuse systems, circuit breakers, or other accepted means of preventing accidental or intentional overloading.

Cords and Receptacles. Preferably, electrical cords should be heavily insulated. Personnel should avoid excess bending, stretching, and kinking of electrical supply cords. All cords should be inspected regularly for signs of defects. Damaged or frayed electric wires, cords, and plugs will be immediately replaced or repaired by qualified electricians. All outlets should be marked with the voltage output. Electrical equipment not used for

WORKING MATERIALS SUCH AS PAINTS, COMBUSTIBLE PACKING MATERIAL AND RAGS WHEN NOT PROPERLY KEPT, PRESENT AN EXTREME FIRE HAZARD.

KEEP TO A MINIMUM QUANTITIES OF HAZARDOUS WORKING MATERIALS. PROVIDE COVERED STEEL CABINETS, BARRELS AND CANS MARKED WITH PROPER IDENTIFICATION.

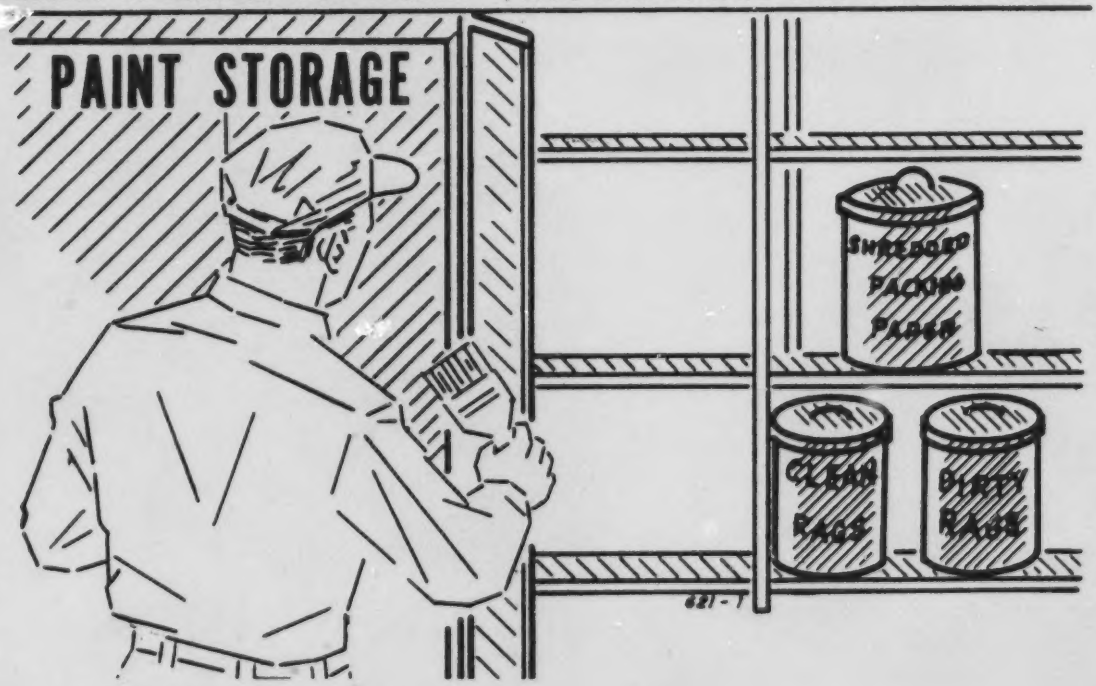


Figure 2-9. Combustible materials.

Figure 2-10.

long periods of time should be disconnected from the power source.

Portable devices. Portable devices such as the pie dough machine, should have the cord tied to the machine in a knot before plugging it in. This will keep the machine from moving if someone happens to stumble across the cord. It will also protect the cord and receptacle from possible damage.

Plugs and sockets. All portable extension cords will be equipped with a nonconducting plug and outer socket shell. All electrical cords are equipped with a three prong plug, except when double insulated portable hand tools are used.

Cleaning Up. Never use excessive water in shop clean-up. Excessive water on the floor is just like an electric chair for the one standing in it. Before cleaning the bakery, always turn off *all* power leads to equipment. See figure 2-11.

Exercise (019):

1. What are some of the safety procedures to observe when working around electrical machinery?

2. How often should electrical equipment in the bakery be inspected?

3. What should you do if you notice a plug broken or a wire frayed?

4. Are you authorized to replace a plug on any of the electrical equipment in the bakery?

HEED ALL WARNING SIGNS

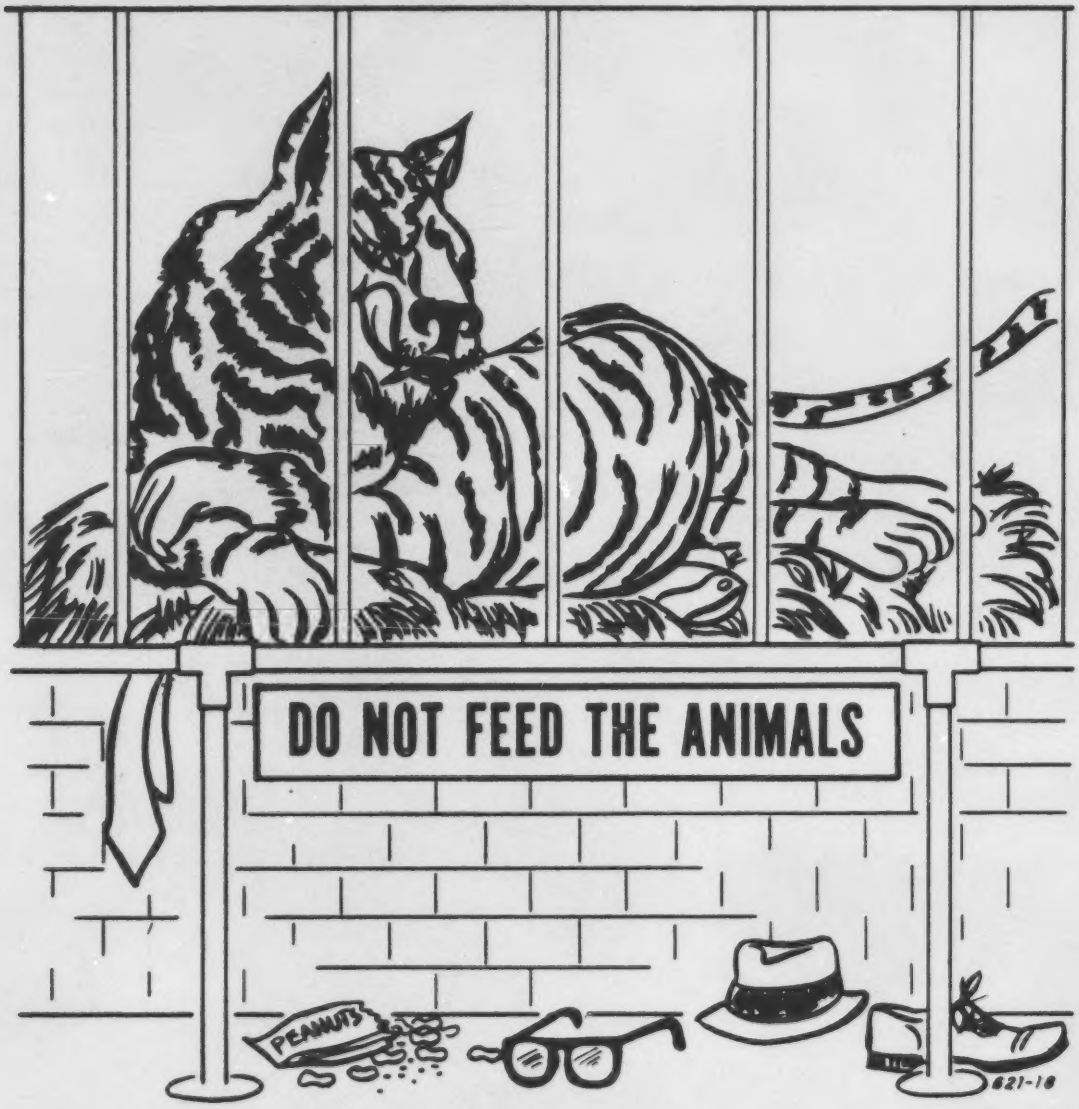


Figure 2-11.

CHAPTER 3

Sanitation and Personal Hygiene

SANITATION IS defined as the science and practice of creating healthy and clean conditions. However, your supervisor will probably refer to sanitation as simply a matter of reaching and maintaining a state of cleanliness. You will soon discover that sanitation is more than a measure, procedure, or condition; it is a way of life.

It will not take you long to realize how your supervisor feels about sanitation. You may believe that thorough and constant cleaning operations represent an unreasonable decision on the part of your supervisor. This is not so; your supervisor knows the sanitation standards and is required to see that the health and welfare of all persons who eat the food you handle or prepare are protected.

This chapter introduces the subject of sanitation as it pertains to food service. We will discuss the importance of personal hygiene, communicable diseases, and control measures to combat these diseases. We will also discuss some of the common cleaning problems, precautions, materials, and procedures. Each facility has its own peculiar problems of sanitation, and it is impossible to anticipate them all. Therefore, if you find a need for more information that is not contained in this chapter, check with your trainer or supervisor.

3-1. Food Service Standards

From your own personal experiences, I am sure you will agree that a clean, wholesome environment is necessary in a successful food service operation. Even if we were to discount entirely the harmful effects upon health that a lack of sanitation creates, we would still be faced with the fact that no one enjoys food which is prepared and served in unclean surroundings. The fresh, distinctive flavor of food simply cannot be maintained unless the food is handled and prepared according to high standards of sanitation.

020. Name the manual that establishes sanitation standards and identify those who assist food service personnel on matters relating to sanitation.

Nowhere is the application of established rules and standards of sanitation more important than in our food service activities. Because of its importance to both health and morale, sanitation is governed by regulations and is measured against definite standards. Each Air Force commander is responsible for enforcing these regulations. Medical service personnel supervise the various activities in matters of sanitation, advise the commander as to the effectiveness of the sanitation procedures employed, and of problems that may exist. Food service personnel work closely with medical service personnel on matters relating to sanitation. Each section supervisor should actively seek the advice and recommendations of qualified medical personnel. With the commander's approval, the food service supervisor carries out the practices and procedures set down by the personnel of the medical department in providing for the health and welfare of those who use the facility.

While Air Force regulations place certain responsibilities for sanitation upon certain offices and persons, the fact remains that we all have individual responsibilities in this connection. To the people with whom we have contact, we have an obligation to devote proper attention to cleanliness and hygiene, both as they pertain to our person and relate to our work areas and quarters. Anyone who neglects his responsibility for sanitation can endanger the health and the lives of airmen who depend upon food service personnel for providing wholesome food served in clean and healthy surroundings.

The authority for establishing sanitation standards in Air Force food service facilities, as well as the responsibility for their enforcement, is outlined in AFM 163-8, *Food Service Sanitation.* A copy of this manual should be on file in all food service activities. You will find the information provided by this manual helpful as a source of reference when sanitation problems are encountered.

Exercise (020):

1. The authority for establishing sanitation standards in Air Force food service facilities is outlined in AFM _____.
2. Food service personnel work closely with _____ _____ on matters relative to sanitation.
3. Because of its importance both to health and morale, sanitation is governed by regulations and is measured against _____.

3-2. Personal Hygiene

Sanitation, like charity, begins at home. If a food service worker is to effectively carry out the established sanitation program in his facility, he must first consider the cleanliness of his own body. There is no place in the food service organization for a person having a casual attitude toward personal cleanliness.

021. List the proper precautions necessary for the food service worker to protect his health as well as the health of others.

Personal hygiene begins with a soap and water attitude. Every person who is directly involved in any food handling operations is expected to use soap and water as generously in keeping himself clean as he would in keeping his own eating utensils clean. One shower daily is considered a minimum requirement; there may be times when two or more are needed.

It is well to recognize the fact that our skins are naturally covered with stapylococci bacteria. They are a major source of food poisoning. Through lack of proper attention these bacteria are permitted to multiply to a point where there is serious danger of contamination of food. The best protection against such multiplication is soap and water. The hands should be washed frequently. They should be washed immediately before going on duty, after visits to the latrine, after using a handkerchief, and after contact with anything that may be a source of germs. Each hand washing must consist of plenty of soap and water. Just running hot water over your hands does not do the job.

It is well to note that sanitation and hygiene involve both physical and mental factors. Good food service personnel not only are clean, they look clean. If you've ever eaten in a greasy spoon cafe or restaurant you can readily appreciate a clean atmosphere in which you can enjoy your food. There is nothing worse than dirt to spoil a good appetite.

A person who takes pride in his profession also takes pride in his appearance and makes sure that his personal habits and mannerisms are socially acceptable.

A pilot making ready for takeoff follows a definite checklist to insure that his aircraft is in all respects prepared for flight. Similarly, a baker should follow some kind of checklist before reporting to work. The following personal hygiene rules are presented as such a checklist:

a. Keep fingernails short and clean. A nail brush should be available at each sink in latrines or any other washup areas. Dirty fingernails not only detract from your sanitary appearance, but also carry collected germs which can pass on to the food you prepare.

b. Bathe daily, especially prior to reporting to work. Foul body odor does nothing but annoy your fellow workers, hinder your personal appearance, and worse of all, endanger the quality and appearance of the pastry being made.

c. Change socks daily as well as your undergarments. This should take no explanation at all. Socks that are dirty will sweat as well as give off bad odor. As for undergarments, changes should be made daily no matter where you work or what you do.

d. Brush your teeth a minimum of twice a day. Unbrushed teeth lead to cavities and stains, both of which lead to possibly endangering your health. Furthermore, this leads to bad breath, which no one likes.

e. Visit your barber or hairdresser regularly and comply with military standards.

f. Shampoo your hair at frequent intervals. A person with dandruff or other scalp disorders does not present a pleasing appearance and may cause contamination of food.

g. A clean-shaved face before reporting for work is mandatory.

h. Wear a clean white hat at all times while in any food preparation area. Female personnel must wear hairnets that are in good repair.

i. Clean whites at the beginning of each workday is a must. These whites must cover the armpits.

j. Polished shoes in good repair should be worn daily. It is a good practice to have two pairs of shoes. This way you can rotate each day and get more wear out of your shoes. If safety shoes are available it is advisable to wear them.

k. To prevent the spread of respiratory germs, coughs and sneezes should be checked with a clean handkerchief, or, more preferably with a disposable tissue.

l. Your face and neck are the most exposed parts of your body while at work. Therefore, these places should not be touched while handling food. This area of the body is exposed to all kinds of germs and can be spread to food quite easily. Most bakeries are hot in the summer months and your forehead will perspire. Never wipe your forehead and then handle food. You can follow a very good policy: "If you wouldn't feed it to your mother, throw it away."

m. Do not smoke in areas where food is being prepared. This is for the obvious reason that ashes may fall into an item being prepared or mixed.

n. Whenever possible, your hands should not come into direct contact with food being prepared. Use a spoon, dipper, or any other appropriate tool that can do the job. This way is usually faster and much more sanitary. When you sample an item, use a clean utensil for each sampling.

o. Any pot or other container that is used for holding food (pie fillings, icing, cake batter, etc.) should be handled by the outside edges only. If the container has handles, *use them.*

p. All jewelry (with the exception of wedding rings) should be removed prior to beginning any food preparation.

q. Get prompt medical attention for all cuts and scratches. Anything beyond superficial cuts and scratches should be treated by qualified medical personnel.

Bear in mind that as a food service member, your general health and appearance is not merely a personal matter. They are of the utmost concern to the people you work with and to those personnel who eat the foods you prepare.

Exercise (021):

1. Personal hygiene begins with a _____attitude.

2. It is well to note that sanitation and hygiene involve both _____ and _____ factors.

3. List ten personal hygiene rules that pertain to food service personnel.

3-3. Communicable Diseases

There are diseases that may be spread from person to person and from animals to humans. This can be done either through direct contact or through close association. These diseases are known as communicable diseases; that is, given or transferred from one person or animal to another. There are three common types of such diseases against which you must be constantly on guard. These three are respiratory, intestinal, and insect-borne.

022. List and identify the three common types of communicable diseases.

Respiratory diseases are those that relate to the lungs and the air passages. The spreading of such diseases is usually a result of discharges from the nose, mouth, throat, or lungs. Common colds, scarlet fever, and tuberculosis are examples of respiratory diseases that are communicable from one person to another. In some of these cases, they may be communicable from animal to person or person to animal.

Intestinal diseases are those which affect the digestive system. Examples are typhoid fever and dysentery. Such diseases are spread by infected food handlers, flies, and other insects or rodents. These may also be spread by contaminated food and water supplies.

Insect-borne diseases are usually considered to be those which are transmitted by bloodsucking insects. An example is malaria, which is spread by the mosquito.

There are three links in the chain for the spread of communicable diseases. These are the source, the means of transmission, and the susceptible person or animal. Control measures may be directed against all three. This involvas isolation, physical inspection, and quarantine. For certain reasons some diseases may require inoculation.

Exercises (022):

1. What are the three common types of communicable diseases?

2. _____ diseases are those that relate to the lungs and air passages.

3. _____ diseases are those which affect the digestive tract or system.

4. _____ diseases are usually considered to be those which are transmitted by bloodsucking insects.

3-4. Disease Control Measures

One of the most important responsibilities in food service operations is preventing the spread of disease. As a matter of fact, this responsibility is the primary purpose of the entire sanitation program, and in this connection, your own good health is of vital importance.

023. State the measures used in food service establishments for controlling disease, give the purposes for the base veterinarians inspection, and indicate what type of inspection is mandatory before a worker can perform duty in a food service facility.

Good health depends upon many factors, most of which are to some degree controllable. Proper rest, plenty of sleep, regular hours, good eating habits, and proper exercise are all necessary to a healthy body and an alert mind.

Supervisor's Inspection. The supervisor's inspection is conducted at the beginning of each work day. It involves both permanent and temporary food handlers. Permanent food handlers include all personnel, military and civilian, who are permanently assigned to duties involving the handling, processing, preparation, or serving of food. Included with bakers are cooks, cooks' helpers, and food service supervisors. You might go a step further and say that this group also includes persons who handle or serve food or beverages of any kind (other than items in unbroken packages). This group also includes those who handle equipment or utensils necessary for the preparation and serving of food as a part of their regular routine.

The temporary food-handler group includes those persons who are assigned to duties in food service activities for relatively short periods of time. This group also includes those who perform duties which do not involve the handling of prepared food or food items served after subsequent cooking or sterilization. Any person whose state of health is not up to par should not work. By working with a cold, sore throat or persistent cough, you can spread disease through contaminating the food you handle. You shouldn't be handling food if you have a skin disease or any type of skin disorder. If you have a cut or sore of other than a superficial nature, you should not wait for your supervisor to find you unfit for duty. If you are ill or are suffering from any injury or any kind of disorder, report it promptly to your supervisor. Most of the time, you will be instructed to report immediately to the dispensary.

Food service personnel, like other nonmedically trained personnel, are prohibited from the self-treatment of wounds or diseases. Medical treatment, regardless of the extent or nature, is strictly a job for the medics. Besides reporting to sick call, you will also be expected to report promptly for the appropriate treatment of cuts, burns, strains, or any other type of injury. Minor ailments will not affect food that you handle. However, if competent medical authorities feel that your presence in a food handling operation is not advisable, you will not be permitted to work.

Medical Services Inspection. In addition to your regular food handlers' inspection and examination, daily inspections by your supervisor, and your own self-inspection, your section will be inspected periodically by a member of the base veterinary section. This inspection is unannounced and usually takes place during the preparation of pastry. The inspector will observe personal appearance, the cleanliness of the area, the temperature of the wash and rinse waters in the sink, handwashing facilities, the techniques used in the preparation of pastry, condition of the freezers and walk-ins, etc. The inspector can also include taking unannounced finger cultures of personnel on duty.

Physical Examination. All permanent food handlers must have a complete physical exam prior to performing duties involving the handling and processing of food and food service equipment. Assuming that you will be a permanent food handler, you will be issued a medical certificate when you pass the examination. This certificate will be posted or kept on file in your duty area. Periodic food handler exams will be mandatory after this time until you are performing a job that does not require you to handle food or food service equipment.

Supervisors in charge of food service facilities are required to make written reports to the base veterinarian naming all permanent food handlers under their control. The base veterinariain takes the necessary steps to have the personnel examined and to keep a permanent record of the findings. Results of the examinations are promptly reported to the organization commander, and personnel found unfit for duty are relieved at once.

Exercises (023):

1. What are the three measures used to control diseases?

2. What type of inspection is conducted before a worker can perform duty in a food service facility?

3. List three purposes for an inspection by the base veterinarian.

3-5. Cleaning Agents

Good sanitation is nothing more than good housekeeping, and good housekeeping is little more than the application of common sense.

In the Air Force, everyone has certain housekeeping responsibilities. Each individual is required to maintain certain standards of order and cleanliness in his living quarters and to observe certain proprieties in conduct. If this were not true, a number of health hazards would develop, and the efficiency of the Air Force would be lowered.

024. Identify the categories of dirt and describe the cleaning agents and methods used in its removal.

The aim of any cleaning operation is the removal of dirt. In terms of cleaning operation, dirt falls into three categories: (1) dirt that is soluble in water, (2) dirt that is insoluble in water, and (3) dirt that produces a stain.

Dirt that is soluble in water requires only water for its removal. But water alone is ineffective against germs unless it is boiling.

Dirt that is soluble in water requires only water for its removal. But water alone is ineffective against germs unless it is boiling.

Dirt that is insoluble in water can be washed away only by using a solvent of an emulsifying agent that will suspend the dirt in the water. Soap in a solution is a combination of both, so it is the most widely used cleaning agent. Soap extends the dissolving action of water and is the best known agent for suspending grease and dirt in water. Detergents are also popular as cleaning agents and can effectively take the place of soap.

A stain is caused by dirt that, if not removed immediately, will change the color of the surface upon which it exists. Prompt attention must be given to the removal of stains to prevent permanent damage to the surface.

Cleaning agents commonly used in food service operations may be divided into two general classes: (1) those emulsifying dirt with water and (2) those removing dirt by abrasive action.

Soap is an agent that cleans as a result of the action of an alkali on fats or oils. It is usually made up of fats or oils combined with an alkali of sodium and has an excess of free alkali. The milder toilet and hand soaps are usually made with palm, coconut or cottonseed oils, combined with either a sodium or potassium type of alkali. Liquid soap is similar to bar soap except that it is insoluble with water.

Detergents are cleansing or purging agents resembling soap in their ability to emulsify oils and to hold dirt in suspension. Detergents have replaced soaps for cleaning in food service establishments. The standard detergent may be in powder, flake, liquid, or paste form. It contains no abrasives or fatty acid soap and is not irritating to the skin.

An alkali is a substance, such as potassium or sodium carbonate, having a characteristic acid taste and the ability to neutralize acids. As you have already learned, alkalis are essential ingredients in soap. But there are many cleaning operations in which alkalis alone are used. They have cleaning power beyond that of soap and are less expensive. The most objectionable feature of an alkali is that its caustic action has a tendency to irritate and burn the skin. Alkalis do not produce suds, but they do soften the material that binds dirt to a surface.

Thorough rinsing is particularly important when the cleaning process involves the use of an alkali. Surfaces that are not properly rinsed continue to be affected by the caustic action of the alkali, and damage may result. In general, alkalis should not be used on wood, linoleum, asphalt, rubber tile, or painted surfaces.

Some of the alkali cleaners in common use include trisodium phosphate, sodium bicarbonate, and borax.

An abrasive is a substance which, when rubbed on surfaces, wears it away. An abrasive cleaner, therefore, is one which cleans by wearing away the dirt and in the process, a part of the surface to which the dirt had clung. If all cleaning is done regularly and properly, there is little need in a food service establishment for abrasives.

Stains may be removed in three different ways: (1) by dissolving the substance causing the stain, (2) by the actions of a bleaching agent, and (3) by absorbing the substance causing the stain. You may sometimes be faced with special stain problems such

as the removal of water stains which appear on washbowls, urinals, and toilet bowls. Such stains may normally be prevented through the use of thorough daily cleaning with detergents. However, when stains do occur and normal detergent action proves inadequate, the use of a damp cloth and a soap-grid cake or scouring powder will ordinarily remove them.

For stain removal, never use any solution that has not been approved by your supervisor. There are a number of solutions that will remove stains, but they will also cause serious and permanent damage to the surfaces upon which they are used. It is far better to leave the stains than to remove them at the expense of removing the surface as well.

Cleaning agents tend to attack surfaces as well as the dirt or grime that appear on those surfaces. For that reason it is always well to consider that surfaces may be damaged in the cleaning process. Usually, there is a preferred cleaning agent and cleaning process for every cleaning operation.

In food service operations we must be doubly alert to the need for good housekeeping. Housekeeping might be called our watchword. Although adequate measures of sanitation are important to every facet of Air Force life, they are imperative when they relate to food.

Exercises (024):

1. List the three categories of dirt.

2. Dirt that is soluble in water requires only _____ for its removal.

3. Dirt that is insoluble in water can be washed away only by using a _____ or an _____ _____.

4. What are the two classes of cleaning agents?

5. What are the different ways to remove stains?

3-6. General Sanitation Measures

High sanitation standards can be maintained only by careful attention to many details by all personnel from the supervisor down to the apprentice.

025. Identify the proper methods for cleaning floors and windows in a food service facility and specify the purpose of such cleaning.

Floors. Floors in a food service facility are subject to hard use, and must be cleaned often and thoroughly. Proper cleaning serves a three-fold purpose. It provides the necessary sanitation, it protects floors against undue damage and wear caused by abrasive dirt, and it adds to the attractiveness of the facility.

The cleaning procedures outlined in the following paragraphs will aid in keeping floors in a good state of sanitation and preservation.

Sweeping. Dirt can be removed from floors by sweeping them with a brush or broom, or by the use of a dry or treated mop. Your supervisor will indicate what type of sweeping tool is best suited for the floor in your facility.

How often a given floor is to be swept depends upon the nature of the activity in the area, the amount of floor traffic, and various local conditions such as the weather, the nature of the soil, the condition of the grass around the building, and the adequacy of sidewalks. In any event, it usually requires no more than a casual inspection to determine whether a floor needs to be swept.

Mopping. Mopping removes dirt that has stuck to the floor surface and cannot be removed by sweeping. The two methods of mopping are: (1) wet mopping and (2) damp mopping.

Wet mopping involves the use of a mop to spread the soap or detergent solution and thus loosen and dissolve the dirt which clings to the floor. The mop is then used to pick up the washing solution, together with the loosened dirt. Also, it removes any of the solution remaining, by the use of a rinse mopping.

Damp mopping is accomplished with a mop that has been dipped into a clear water solution and has been wrung out. This type of mopping removes the dust from the floor. Damp mopping is especially useful in the kitchen where the use of a broom is prohibited. The reason the broom is prohibited is that it raises dust, thus contaminating the food that is being prepared or has already been prepared. Damp mopping removes the dust without spreading it around.

Waxing. Water emulsion wax is the most common type of wax used in dining halls. It may be applied with either a lamb's wool applicator or a

clean mop. If a mop is used, make sure it is free of soap or dirt.

When applying the wax, evenly coat a small area at a time. Once you have started applying the wax in one direction, continue in the same direction. Do not rub the floor surface with the applicator after the wax has been applied.

Buffing. Wax should be thoroughly dry before buffing. The task of buffing is accomplished by a disk-type buffing machine or a cylinder-type machine with a tampico brush. A lamb's wool pad or a piece of blanket can be placed under the buffer to give a higher luster or to remove brush marks.

Window Care. Few things detract more from the appearance of a bakery than dirty windows. How often the windows require cleaning depends upon many factors such as the season, the local terrain, the extent to which the air is filled with smoke, the local climatic conditions and the local method of heating. All of these factors, along with many others, have a direct bearing on the condition of the windows. We might say that the thorough cleaning of all windows on a once-a-week basis represents an average or typical requirement. In summary, if the windows look dirty, clean them.

For normal window cleaning, clear water is usually all that is needed. The water should be used sparingly and changed frequently. Water can be removed from the window panes with a chamois, a rubber squeegee, or a clean lint-free cloth. For hard-to-clean windows, use a solution recommended by your supervisor or trainer.

Maintaining a high standard of sanitation in the bakery involves close attention to a great many details. It also involves the complete cooperation of all personnel assigned to the facility.

Exercise (025):

1. There are three purposes for the proper cleaning of floors. They are _____, _____, and _____.

2. A good rule to follow in determining whether or not windows need cleaning is if windows look as if they need cleaning _____.

3. What are the two methods of mopping?

3-7. Insect and Rodent Control

Another important factor in sanitation is the positive control of insects and rodents. No single measure will completely control the problems associated with the insects and rodents that infest food establishments. However, when we analyze all the elements of an insect and rodent control program, we find that this program is composed of two phases. The first phase includes the elimination of the breeding places, proper storage of refuse and garbage, and installation of screens to prevent the entry of pests into the food service facility. The second phase involves the use of chemicals or pesticides to control the pests that have already infested the building or surrounding areas.

026. Identify the common types of insects and rodents and state the measures used to control these pests.

The common types of insects found in food establishments are the common housefly and the cockroach. There are other insects that cause problems, including several types of mites, beetles, bugs, and moths. These insects seldom cause disease, but cause the food products to be filthy and unwholesome. The following paragraphs will deal with only the two most common types.

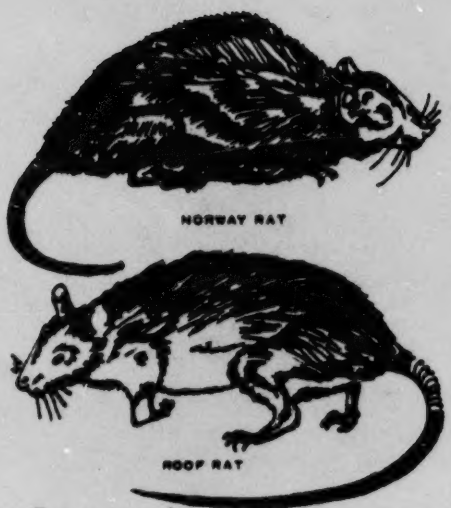
Flies. The fly is one of the most common of all food-infecting insects, and one of the filthiest. A fly is bred in filth and lives in filth, so you can see that the elimination of filth will reduce the fly population. When a fly travels from filth to food, it carries in its stomach and on its feet, millions of bacteria that are depositied on the food. Note the life cycles and stages of development of some common insect pests and also two common types of rodents in figures 3-1 and 3-2.

Flies can be controlled through proper sanitation, by eliminating their breeding areas, by proper screening of windows and doors, and by the use of chemicals to kill both adults and larvae (maggots). Elimination of all unnecessary sources of attraction for flies is essential in fly control programs. Therefore, the following control procedures must be given special attention by all food service personnel.

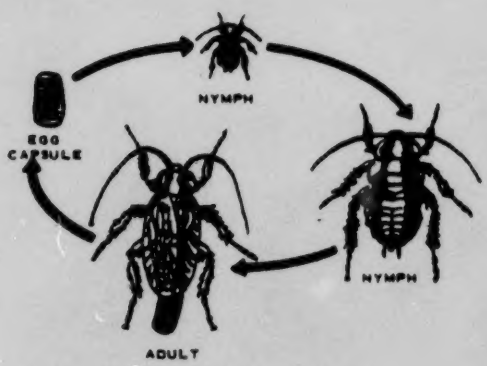
To eliminate breeding places of flies, all human waste, animal manure, and garbage must be covered, disposed of, or treated promptly and effecitvely. In any fly control program strict observance of the following is most important:

a. Have garbage picked up at least once a day.

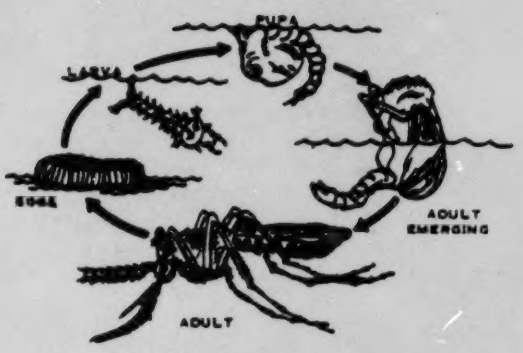
b. Keep garbage cans clean and covered with tight-fitting lids.



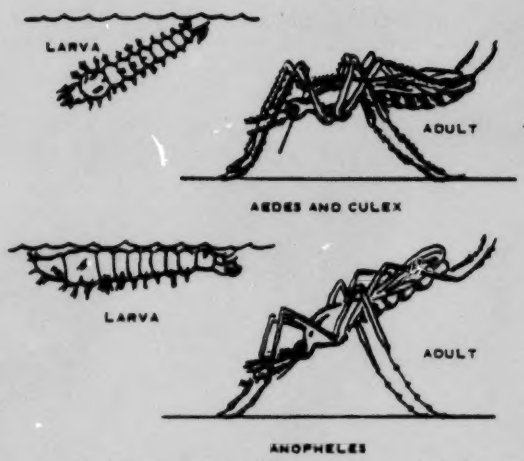
Two common domestic rodents.



Life cycle of the cockroach.



Life cycle of the mosquito.

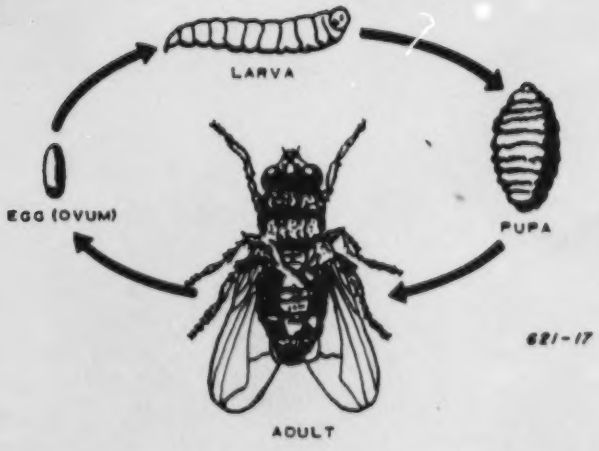


Typical positions of mosquitos in their larval and adult stages. 621-19

Figure 3-1. Insects and rodents.

The adult black fly.

The common stable fly.



Life cycle of common housefly.

Figure 3-2. Flies.

c. Keep the ground area around garbage racks free of refuse.

d. Keep exterior and interior grease traps free of refuse.

e. Protect foods by screening or refrigeration.

f. Clean latrines daily.

g. Screen all windows and doors.

Roaches. The roach is another creature that thrives in food service installations without a continuous control program. These insects secrete a foul liquid from their scent glands, an obnoxious saliva from their mouths, and leave mucous-covered excreta behing in their travels.

Roaches thrive in the presence of food, warmth, and sheltered locations. They are most active at night, usually remaining concealed in cracks or other hiding places during the day. Their favorite breeding places are under steam tables, sinks, drains, and storeroom shelving. In their search of food, they contaminate exposed food, dining and work tables, utensils, and food preparation equipment. Roaches can and must be controlled; however, this is not an easy task. Only through a continuous control program of excellent sanitation and insecticides can these creatures be eliminated.

To control roaches, fill all cracks and crevices, eliminate all likely breeding places, keep food covered, and watch food deliveries so that no roaches are brought into the bakery.

Rodents. Such rodents as rats, mice, and ground squirrels not only act as reservoirs of disease but also destroy large amounts of Air Force food supplies. They damage buildings and equipment and cause fire losses by gnawing the insulation of electrical wiring. A few of the rodent-borne diseases are endemic typus, bubonic plague, trichinosis, infectious jaundice, and various intestinal diseases. An effective rodent control program can eliminate any rodent problem.

Actually, the control of rodents, like the control of insects, begins with good housekeeping.

Exercises (026):

1. What are the two most common types of insects found in food service establishments?

2. Name four ways to control flies.

3. Name four ways to control roaches.

3-8. Sanitizing Equipment

In any Air Force bakery, you will notice various types of equipment. It will be up to you and your fellow workers to take the steps needed to keep this equipment in good working order and, more importantly *CLEAN*! I'm sure that your mother didn't mash potatoes with a dirty whip; likewise, your father didn't carve a turkey with a dirty knife. This is because they cared about what they fed you. We will try to instill in you the importance of clean equipment in a bakery or any facility where you prepare food for another person's consumption. If you can develop a conscientious attitude, this cleanliness will become an everyday thing to you.

027. Explain the operating, cleaning, and storage procedures of selected equipment in the bakery.

The equipment mentioned in the above objective is referring to two types of equipment: (1) cleaning equipment, and (2) equipment used in the preparation and baking of pastry. We will first look at the equipment used for cleaning the various parts of the bakery.

Wringer. The wringer is used to remove water from mops; the bucket is the receptacle that catches and holds the water. The wringer consists of two long rollers set on a metal frame. Buckets may be of different shapes and sizes.

Some scrub buckets have the wringer attached to the side. To use this type, place the mop between the rollers and press your foot on the pedal. This will bring the two rollers together on the mop head. Hold the other foot on the foothold attached to the bottom of the bucket. Next, apply steady pressure on the mop while lifting it up. Turn the handle clockwise and remove the mop.

When using buckets and wringers that are separate, place the wringer on the bucket by engaging the slots on the wringer over the side of the bucket. Place the mop between the rollers, turn the latch on the wringer toward the inner part of the bucket, grasp the handle, and turn it clockwise. Repeat the process until the mop is as dry as you can get it. It will help if you twist the mop and repeat the process. Turn the latch in the opposite direction to remove the mop.

There is another type of wringer you will be using that is not attached to the bucket. This type has a handle on it, but it does not turn. On this type, simply insert the mop in the wringer and push the

handle down. Release the handle and remove the mop.

To clean the bucket after use, place a small amount of hot, soapy water in the bucket; then place the wringer on the bucket. Place a mop in the bucket of water and slosh it around. After this is done, dump the water and replace it with clear, hot water. Place your mop in the water and rinse it thoroughly. Using a brush, scrub the bucket thoroughly and place it upside down to dry.

Other cleaning equipment in the bakery includes brushes, mops, brooms, and squeegees. The brushes vary in size and shape, depending on their purpose. To keep these items in good condition, clean them thoroughly after each use and store them properly. To clean brushes, mops, brooms, and squeegees, wash them in warm, soapy water and rinse them thoroughly in hot, clear water. Place them in their proper place and let them air dry.

Pie Dough Machine. When cleaning the pie dough machine, it is very important not to use excessive amounts of water. The first thing to do is remove the plates from the machine. These can be washed at the sink in hot, soapy water. Next, take a soft brush or a clean rag and remove all of the flour that you possibly can. Remove the top roller guard and clean off all the dough that has accumulated on the roller. Wipe down the roller with a clean, dry rag. Never allow water to touch the rollers, as this will cause rust to set in. Let the plates air dry over night and reassemble the machine at the beginning of the next shift. As a good safety-minded airman, remember never attempt to clean the rollers or any part of the machine while it is in motion. The roller will catch the rag and take your fingers through the rollers. Figure 3-3 illustrates this piece of pastry equipment.

Vertical Mixer. The vertical mixer is a multispeed machine designed for various mixing tasks in pastry kitchens. You must proceed with caution when cleaning it. The working mechanism consists of a starter switch, clutch, gearshift lever, and speed indicator plate. Before cleaning this machine, be sure to turn off the start switch, and as an added precaution, turn off the main power switch on the wall. All attachments, including the mixing bowl, should be washed with soapy water and then rinsed thoroughly with clear water. The mixer should be washed with a damp cloth which has been dipped in warm, soapy water and partially wrung dry; then it should be wiped down with a damp cloth that has been dipped in clear water. When cleaning the mixer, consider the following cautions:

- Do not use excessive amounts of water when cleaning the machine.
- Make sure that there is no large amount of water on the floor while cleaning the mixer.
- Make certain that all power sources leading to the mixer are turned off before cleaning the machine.
- Never use strong cleaning agents on the mixer. This will remove the luster of the mixer. A mild detergent mixed with hot water will do the job nicely.
- Be careful not to drop paddles; these are made of cast iron and will break quite easily.
- After the mixer is cleaned and dry, it is a good practice to run the machine in third speed without any attachments or bowl on the machine. This will throw out any excess water that may have gotten into the mixer. If this is not done, you may get soapy water mixed with grease in an item being mixed the following day.

Handtools. The handtools used in baking are shown in figure 3-4. Some instructions for the proper cleaning and storage of these items are given below.

a. Wash wooden utensils with warm, soapy water, rinse with clear, hot water, and dry thoroughly. Do not soak rolling pins, wooden-handled knives, or other wooden utensils in water. Soaking will cause the wood to expand; and as the wood dries, it will contract. The expansion and subsequent contraction of the wood will cause it to deteriorate.

b. Wash other handtools thoroughly with hot water and soap or detergent; rinse with clear, hot water, and air dry.

c. Store utensils and tools in a dry place; do not stack.

Baking Pans. The sheet pans, layer cake pans, pie tins, and muffin tins used in baking are shown in figure 3-5. Clean these pans thoroughly after each use so that there is no trace of pan grease or food left in the pans. Wash the pans with hot water and soap or detergent, rinse with clear, hot water, and air dry. Store pans in a dry place, bottoms up, and do not stack.

Steam-Jacketed Kettle. The steam-jacketed kettle is used mainly to prepare large quantities of bakery items such as pie filling, custards, and frosting. To cook these items, steam is circulated between an inner and outer shell, producing an even distribution of heat for cooking. Steam-jacketed kettles are constructed of aluminum or stainless steel. Sizes are determined by the capacity in gallons; i.e. 20, 40, 60, and 80. The 40 and 60 gallon sizes are used in most Air Force bakeries. Steam kettles can be dangerous equipment if not

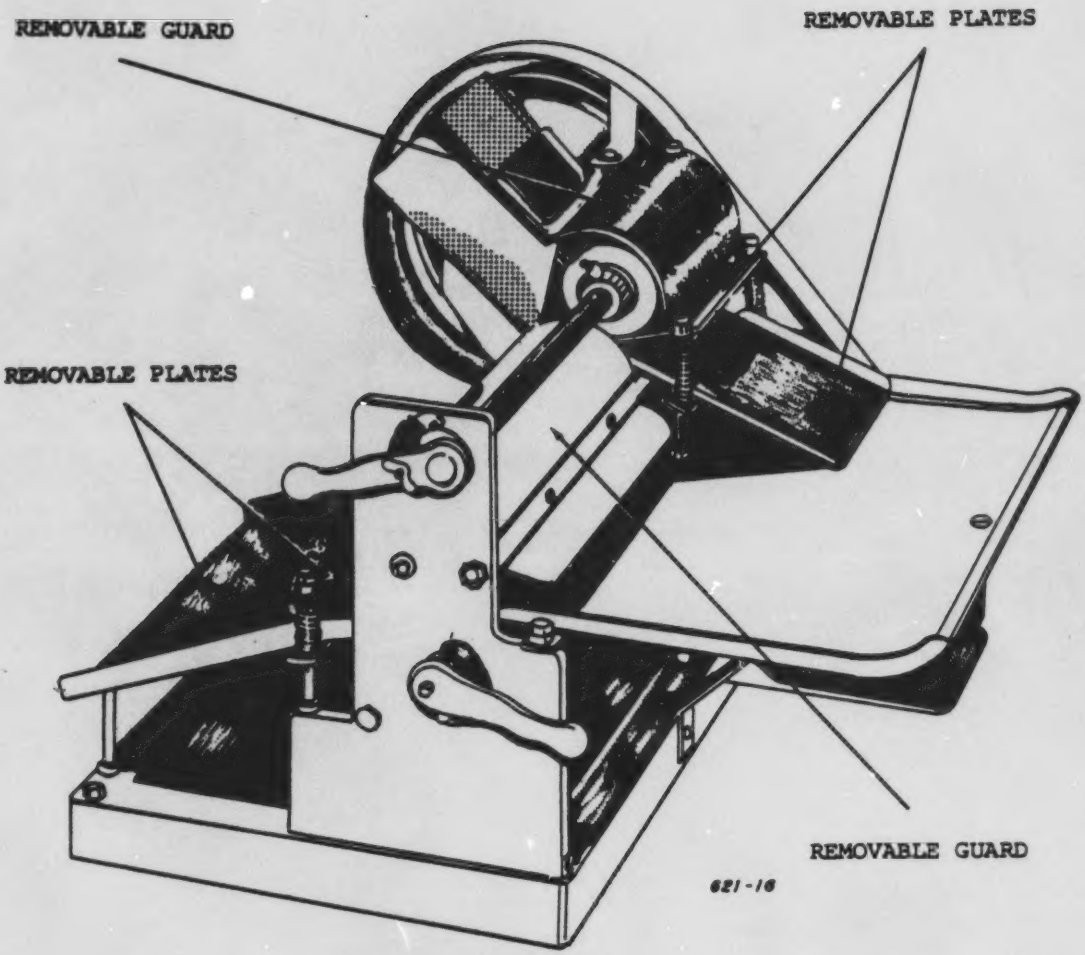
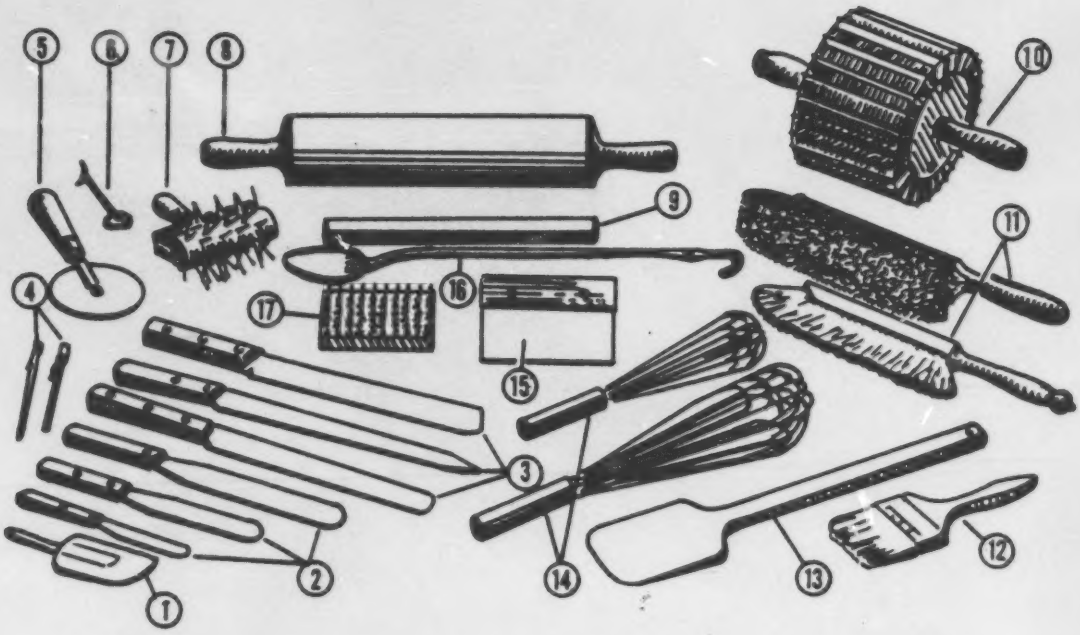


Figure 3-3. Pie dough rolling machine.



1	Rubber bowl scraper	7	Docker	13	Wooden paddle
2	Spatulas	8	Large rolling pin	14	Wire hand whips
3	Knives	9	Small rolling pin	15	Dough scraper
4	Thermometer and case	10	Bun divider (squirrel cage)	16	Long-handled spoon
5	Pastry wheel	11	Bench brushes	17	Docker (improvised)
6	Pie jagger	12	Pastry brush		

621-13

Figure 3-4. Handtools.

handled properly. Never turn on the steam unless water or food is in the kettle. If an empty kettle is allowed to heat, it may crack because of contraction when cold food or water is put into a hot, dry kettle. This may cause leaks. When the contents of the kettle are cooked, close the steam supply valve and remove the finished product.

To clean steam kettles, regardless of the size, you must follow certain cleaning procedures. They are as follows:

a. Carefully remove the clogged strainer. Empty it and then wash and rinse it thoroughly.

b. Remove any food particles from the drain pipe and valves with a rod that has a flexible wire brush.

c. Wash the interior of the kettle with soap and water. Use soap and a stiff brush if spots appear on the cover of the kettle wall. Again, rinse thoroughly.

d. Wipe the exterior of the kettle wall and the legs with a damp cloth.

e. If a cooked item has stuck to the walls of the kettle and cannot be removed by the above method, do the following:

(1) Fill the kettle with soapy water and turn on the steam.

(2) Allow the water to boil; then turn off the steam.

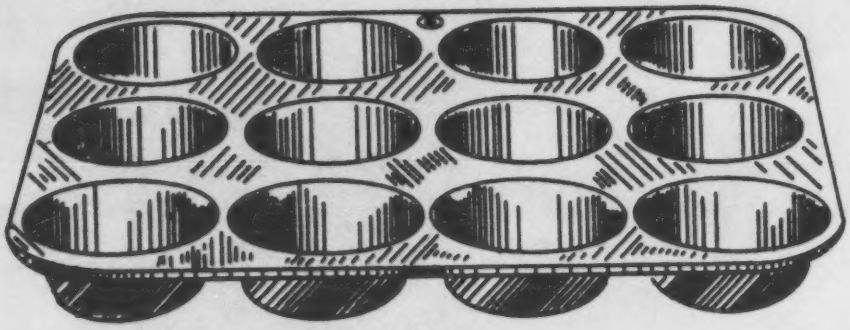
(3) Let water sit in the kettle for approximately 1 hour.

(4) Drain the water and use a brush to scrub the walls of the kettle.

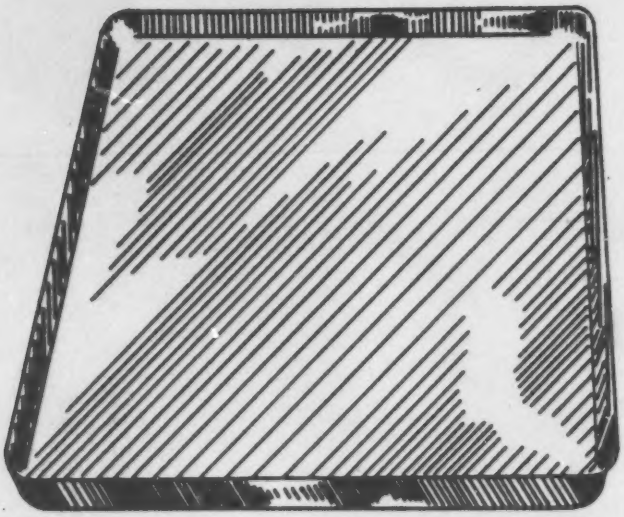
(5) Rinse thoroughly and inspect the kettle to be sure that all food is removed.

(6) Clean the outside of the kettle with any type of stainless steel polish. However, be sure not to get any cleaner inside the kettle where food will be prepared.

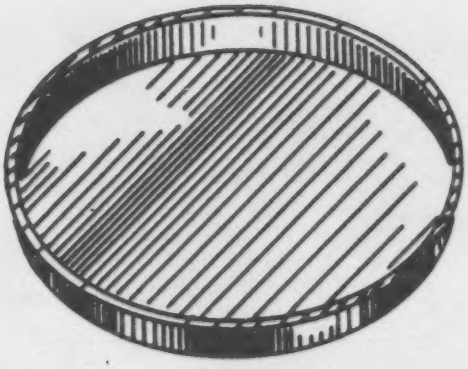
To keep the steam kettle in good condition and to



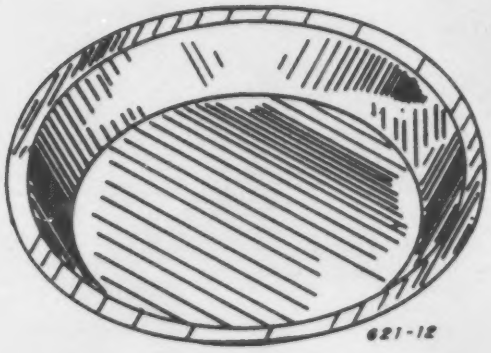
MUFFIN TIN



SHEET PAN



LAYER CAKE PAN



PIE TIN

Figure 3-5. Baking pans.

maintain safe working condition, observe the following rules:

- Leave the cover open when the kettle is not in use.
- Inspect the steam pressure and see that there are no steam leaks in the fittings, piping, or valves.
- Lift the safety valve regularly to make certain that the disc is not sticking to its seat.
- Always open the steam outlet valve on directly connected modules before turning on the steam valve.
- Open the steam inlet valve a little at a time, and do not open it fully until all cracking noise has stopped.

Exercises (027):

1. What is the purpose of the wringer?

2. How do you operate a wringer that is not attached to the bucket?

3. State the procedure to follow when cleaning the pie dough machine.

4. What type of detergent or cleaning agent should you use when cleaning the vertical mixer?

5. If an empty kettle is allowed to heat, it may _____ because of contraction when cold water or food is put into the hot, dry kettle.

6. What items are used to clean the outside of the steam kettle?

7. Why is it important that you never soak wooden-handled tools in water?

8. Baking pans should be stored in a _____ place, _____ up, and should never be _____ .

3-9. Storage of Cleaning Supplies

"A place for everything, and everything in its place." This should be the rule for the storage of cleaning supplies and equipment. The main task of an Air Force baker is to do his job to the best of his ability and to turn out tasty pastry that he can be proud of. Let's face it, soap smells really good. However, we must admit that we don't want it in our food. So the following paragraphs will help you decide where you should keep your soaps and supplies so that there is no way you will ruin your pastry with the taste of good-smelling soap.

028. State the proper storage techniques for cleaning supplies and equipment.

As we have stated above, soaps and detergents should never be stored near food supplies. Many food items absorb odors readily and don't need to come into direct contact with detergents in order to pick up their odor.

Adequate storage racks should be provided for brooms, mops, and other cleaning equipment. These items should also be kept away from food supplies. Dry cleaning rags should be placed in bins or racks designed for that purpose. Dirty rags should not be kept in the subsistence storeroom.

Gasoline, oil, paint, and oily or greasy rags must be kept outside the bakery. Kept inside the facility, they are likely to contaminate food supplies. Even more important, they create a definite hazard. Ideally, an outside locker located well away from the bakery facility should be provided.

Sanitation is just as important in the storerooms and refrigerated areas as in the actual food preparation areas. A lack of proper attention to cleanliness in the storage space can cause some of the food items to become unpalatable and can also in many instances cause spoilage.

All storage space, including refrigerated units, should be kept clean, orderly, and as dry as possible (see fig. 3-6). Space used for dry stores should be cleaned as frequently as required. Refrigeration space must also be cleaned daily. Defrosting should be accomplished before 1/4 inch of frost is accumulated.

In small bakeries, storage facilities are usually limited, particularly those facilities that are refrigerated. Limited facilities sometimes necessitate deviations from the recommended storage procedures. Under such conditions, the proper sanitation procedures become doubly

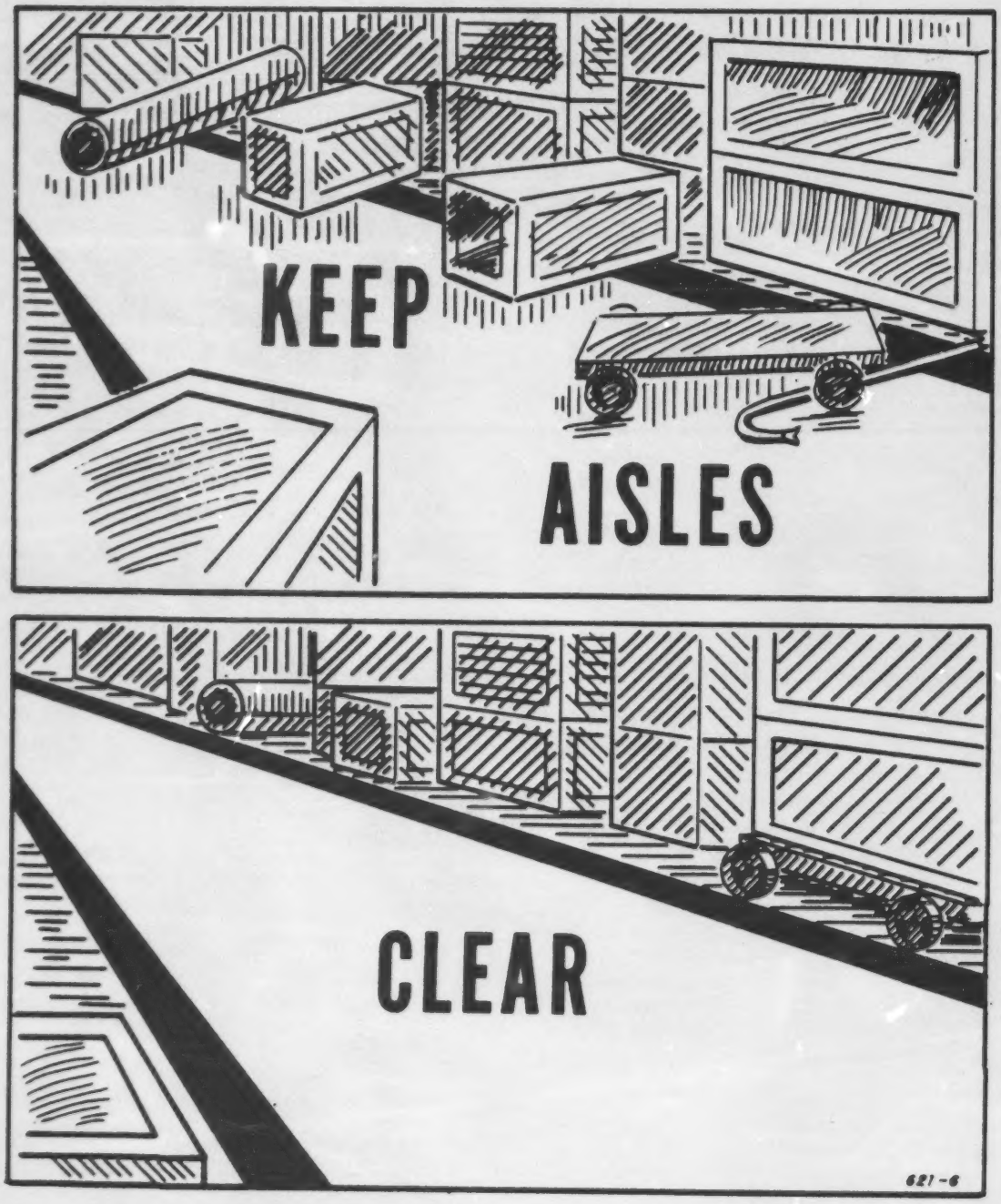


Figure 3-6.

important, since it may be necessary to store together items that are normally stored separately.

Exercises (028):

1. Where should you store rags after they have been used to clean paint brushes?

2. Where should you store cleaning supplies and equipment?

3. What is likely to happen to food supplies if gasoline rags are left inside the bakery?

Baking Fundamentals and Production of Pastry

THIS CHAPTER deals with the basics of baking terminology, functions of ingredients used to produce pastry products, and the actual production of pastry. Good pastry is never an accident. It is the result of the baker's knowledge of baking. This is to include each phase of the baking operation from the basic ingredient to the finished product. This chapter is not designed to teach you the entire field of baking. Instead, it provides you with the knowledge you need to begin your career as an Air Force baker. This CDC, along with your duties in the bakery, will get you started in the baking field. It is up to you to learn as much as possible about baking; this can be done only by working in a bakery.

4–1. Baking Terms

In the process of your normal duty day you will hear different terms used in the bakery. The following paragraphs will identify some of these terms. For a more detailed list of terms, refer to the glossary in the back of this volume.

029. Given a list of baking terms and a list of definitions, match each term with its definition.

Words do not always mean what you think they mean when hearing them. You must recognize what you are doing and associate the word with the job. For instance, what would happen if you told a dishwasher to wash a pie? What would happen if you told a maid to dust a piece of dough? Would these people know what you wanted them to do? Probably not. But pies are washed and dough is dusted.

Wash. This is a liquid brushed on the surface of an unbaked product, usually a pie, to give it a golden brown color when it is baked. The liquid may be water, milk, thin syrup, eggs, or a combination of these items.

Dust. Distribute a film of flour to prevent dough from sticking on a work table or piece of equipment. Dough is dusted to prevent it from sticking to the rolling pin or the table. The flour used for dusting is either a hard wheat flour or bread flour.

Dough. This is a mixture of combined ingredients for pie crust, cookies, sweet rolls, etc., stiff enough to be kneaded.

Knead. To knead is to shape or form a dough into a desired shape or form. This is done by working the dough with the hands as if you were massaging.

Cake. This is a leavened and shortened sweet product containing flour, sugar, salt, eggs, milk, liquid, flavoring, shortening, and some type of leavening agent. Most cakes used in Air Force bakeries are prepared and require only the addition of eggs, flour, or water.

Batter. This is a mixture of combined ingredients such as flour, sugar, eggs, shortening, and milk, thin enough to be poured or dropped from a pastry bag, spoon, or by hand. This is to include cake batter, cookie batter, brownie batter, etc.

Pie. A pie is a dessert with a crust bottom, fruit, cream, or custard filling and meringue, whipped cream, or crust top.

Ice. To ice is to apply frosting.

Glaze. This is a cooked syrup used to put a shiny finish on pastry items.

Frosting. Frosting is a mixture of sugar and other ingredients, such as shortening, egg whites, and flavoring, used to finish cakes and to decorate cakes.

Texture. The texture refers to the interior grain or structure of a baked product, as shown by a cut surface, or by the feeling of a substance under the fingers.

Bake. This means to cook by dry heat in a closed place. This is done in an oven.

Exercises (029):

1. Match the term in column A with its proper definition in column B.

Column A	*Column B*
1. ___ Wash.	a. A leavened or shortened sweet product.
2. ___ Dust.	b. A dessert with a crust bottom, filling, and a top or topping.
3. ___ Dough.	c. Liquid brushed on an unbaked product.
4. ___ Cake.	d. A mixture of combined ingredients stiff enough to be kneaded.
5. ___ Batter.	e. Used to finish and decorate cakes.
6. ___ Pie.	f. A mixture of combined ingredients thin enough to be poured.
7. ___ Ice.	g. To shape with the hands.
8. ___ Knead.	h. Distribute a film of flour.
9. ___ Glaze.	i. A cooked syrup used to put a shiny finish on pastry items.
10. ___ Frosting.	j. To apply frosting.

4-2. Function of Baking Ingredients

Each ingredient used in the production of pastry items has its own function. Some act as binders or structure builders, while others give volume, add color, sweeten, or give moisture and palatability to the product. Other ingredients tend to enhance freshness, to tenderize, or to leaven.

030. Identify characteristics and functions of given ingredients used in the production of pastry.

Flour. Flour is the chief structure builder in most cakes, pastries, and rolls. Its absorptive abilities allow the use of water, eggs, shortening, and milk in batters and doughs. The absorptive abilities of flour depend upon the type of flour used. Pastry flour, which is used largely in cakes, will absorb less liquid than bread flour, which is used to produce yeast-leavened pastries. When bread flour is used in cake production, it is necessary to replace up to 10 percent of it with cornstarch.

Sugar. Sugar in some form is used in all pastry recipes. It is an important ingredient because sugar crystals have a cutting effect on flour portions during mixing. The amounts and types of sugars used control such factors as sweetening, caramelization, moisture retention, and the outward spread of the various pastry products during the baking process. Various types of sugar and their functions are as follows.

Granulated sugar. Granulated sugar is used as a sweetener in cakes, yeast-raised pastries, pie fillings, and cookies. In yeast-raised pastries it also acts as a yeast food. In cookies, the size of the granule has a tendency to control the spread of the cookie. In pie fillings, sugar increases the palatability, body, and character of the filling. Granulated sugar acts as a tenderizer. It also has softening effects on the proteins of the flour and allows cakes and other pastries to be baked at lower temperatures, because granulated sugar lowers the caramelization point of batters and doughs. It also improves the keeping qualities of pastry items through its moisture-retaining abilities. In cakes, granulated sugar aids in obtaining volume, because during mixing, the crystals reduce air incorporated into the batter.

Powdered sugar. Powdered sugar is used primarily for frosting, but can be substituted for part or all of the granulated sugar in pastry recipes. When used in cake batters, the cake batter will have a finer cell structure, but the liquid content of the batter has to be adjusted. In cookies, it produces a compact, fine grain interior, allowing the cookie a minimum amount of spread while baking.

Brown sugar. Brown sugar is used to obtain a certain flavor. When brown sugar is used in place of granulated sugar in cookies and cakes, baking soda must be used to adjust the acidity of the mix. The crystals of brown sugar are soft and dissolve completely during mixing. Therefore, it is necessary to make adjustments in recipes to obtain the required spread in cookies and pliability in cake batters. Brown sugar can be substituted for part or all of the granulated sugar in such pie fillings as apple, pumpkin, and sweet potato.

Molasses. Molasses is used in cake and cookie recipes to give these items a particular flavor. In pumpkin and sweet potato pies, it can be used as part of the sugar content of the filling. The color that molasses gives to cake and cookies is largely dependent upon grade, type, and quality being used—as with brown sugar. Recipes containing molasses as an ingredient must also be adjusted to compensate for the acidity and moisture differences.

Honey. Honey is used in pastry baked items to obtain a distinct flavor. It can be used in icing, glazes, pie fillings, cake batters, and yeast-raised sweet doughs. Honey gives cookies a chewy quality and aids in giving all pastry items a rich brown crust color.

Syrup. Syrups can be used to improve the keeping qualities of finished pastry products and provide elasticity in cakes which are formed after baking (such as jelly rolls). When syrup is used in pie

fillings, it seals in flavor and improves the texture and sheen of the filling. In pie doughs, syrup should be thoroughly dissolved in the remaining liquid required before it is incorporated. Syrups issued for baking contain approximately 80 percent solids and should be substituted only as a portion of the sugar called for in the recipes and formulas. Since the solid content of the syrup is 80 percent, the remaining 20 percent, which is liquid, must be deducted from the normal amount of liquid in a recipe or formula.

To determine the amount of syrup (in pounds) needed to replace the sugar, multiply the amount of sugar (in pounds) to be replaced by 100 and divide the result by the solid content of the syrup (expressed as a percentage). To find the number of pounds of liquid that must be subtracted from the formula or recipe, subtract the amount of sugar (in pounds) to be replaced from the amount of syrup (in pounds) needed to replace the sugar. An example is shown below:

$$\frac{\text{50 (pounds of sugar to be replaced)}}{\text{80 (percent of solids in syrup)}} \times 100$$

$$= \text{62.5 (pounds syrup needed)}$$

62.5 (pounds of syrup)
-50.0 (pounds of sugar)
12.5 (pounds of liquid must be deducted from recipe or formula)

Salt. Salt is used in cakes to prevent excessive sweetness and to intensify the natural flavor of other ingredients used in the batters. In icings, salt acts as a stimulant to the taste buds and brings out pleasing tastes that would otherwise seem flat. When salt is used as an ingredient in baking, it enhances flavor even in such items as pie doughs, fillings, custards, and puddings. In yeast-leavened cinnamon rolls, it aids in the control of fermentation. Granulated (table) salt is best suited for pastry production and is the type normally issued for pastry kitchen use.

Shortening. Shortening used in the production of pastry is usually of the solid form. Liquid shortenings are not meant to be used in cake batters; however, their use is acceptable in yeast-raised doughs. Shortening improves the eating quality of cakes and other pastry kitchen produced items by improving their nutritional value and by making them soft, moist, and tender. Without shortening, pastries would be dry, compact, solid masses. When the gases from the baking powder and the air and moisture that are worked into the cake batter during mixing expand in the oven, the shortening acts as an internal lubricant to reduce internal friction and allows the expanding bubbles to slide past one another, creating expansion and volume. The use of shortening enhances the freshness of all pastry kitchen items in which it is used. The proper type of shortening and the correct mixing operation create a uniform and stable emulsion that coats the batter and dough particles; thus, while baking, the film of fat retards the escape of moisture, which helps baked items to stay fresh longer. In pie dough, shortening helps to make pie crust tender and is responsible for its flakiness. The degree of tenderness and type of flake is largely dependent upon how much shortening is used, to what degree it is blended with the flour and how much it is mixed. In cookies, shortening not only makes cookies soft, tender, and nutritious, but it is also responsible for the amount they spread outward during baking.

Eggs. In cakes, eggs provide moisture, flavor, and food value. Structure (the most important contribution of eggs to cake) is provided by egg protein coagulation during baking. In foam-type cakes, eggs are the primary leavening agent. When used in pies such as custards, creams, and chiffons, eggs contribute quality, flavor, and color and also act as a thickening agent. In cookies, eggs both tenderize and toughen. The yolk of the egg is the tenderizer because of its fat content, and the egg white is the toughening agent because of its protein, which coagulates during baking and acts as a structure builder. You can use whole eggs or just the whites or yolks, depending upon the type of cookie desired. Whole eggs contribute the combined characteristics of moisture, shortness, and aeriation in cookies. In yeast-leavened sweet dough, eggs contribute nutritional value and wholesome flavor. By supporting the weight of sugar and shortening, they prevent the product from being dense and heavy. For best results, the weight of shortening and eggs should be about equal.

Milk solids. Milk solids add flavor, retain moisture, and aid in control of crust color in all pastry kitchen baked items. The solids of milk have a binding effect on flour proteins, causing a slight toughness in the finished product. In pies such as the cream and custard types, milk solids add body, flavor, quality, and palatability to the fillings.

Leaveners. The type of leavener used is dependent upon the type of item being produced. Yeast is used in the production of cinnamon rolls, yeast-raised doughnuts, and Danish pastry. Baking powder is used in cake batters. Its function is to make these types of items rise in the oven while baking. Baking soda is used in cake batters which contain buttermilk, molasses, or sour milk, to neutralize the

acidity of these ingredients. When baking soda is used in devil's food cake, it produces the characteristic red color in the cell structure. The use of excessive amounts of baking soda results in a soapy taste in the finished product.

Exercises (030):

1. Flour is the chief _____ _____ in pastry products.
2. In yeast raised pastries sugar acts as a _____ _____.
3. Powdered sugar is used primarily for _____.
4. The crystals of brown sugar are _____ and _____ completly during mixing.
5. Molasses is used in cake and cookie recipes to give these items a _____ _____.
6. Honey gives cookies a _____ quality and aids in giving all pastry items a rich brown _____ color.
7. When syrup is used in pie fillings, it seals in falvor and improves the _____ and _____ of the filling.
8. In yeast raised doughs, salt aids in the control of _____.
9. In pie dough, shortening helps to make pie crust _____ and is responsible for its _____.
10. Egg's most important contribution to cakes is the _____ of the cake.
11. Milk solids aid in control of _____ _____ in all pastry items.
12. The use of excessive amounts of baking soda results in a _____ _____ in the finished product.

4-3. Cakes

Instructions on how to mix a particular pastry item are usually contained on each recipe that is best suited for that particular mix. All ingredients in any type of bakery item should be carefully weighed. Too much of one ingredient and too little of another could result in an inferior product.

031. Identify the two types of scales used in the bakery.

One of the most important segments of pastry production is the act of weighing products prior to mixing (fig. 4-1). Two types of scales are used in the bakery to weigh ingredients. To weigh large amounts of items such as flour, sugar, and shortening, a heavy-duty scale is used. For items such as cinnamon, salt, and baking powder, a light, sensitive scale is used. Take care in weighing items

Figure 4-1. Scaling batter.

accurately. Never weigh one item on top of another. This will lead to faulty scaling.

Exercises (031):

1. State the two types of scales used in the bakery

Before cake batter can be panned the pans must be prepared. The following paragraphs will explain the four ways in which these pans are prepared.

032. State four ways pans are prepared for cakes.

Pan preparation. When preparing pans for baking cakes, you must select pans that are not dented or warped. If a pan is warped, the cake batter will run to the low side and you will have a cake that is thick on one side and thin on the other. If the pan is dented, it will cause uneven baking. After pans are selected, they must be prepared so that the cake can be removed after baking. There are four basic methods of preparing (greasing) pans for cake. The four methods are (1) using a shortening and flour mixture, (2) using a salad oil and flour mixture, (3) lining the pan with paper, and (4) greasing the pan with shortening and dusting it with flour.

Exercises (032):

1. List the four ways pans are prepared for cake.

033. Identify the two types of cakes mixed in Air Force bakeries.

Mixing. Mixing is the process by which all ingredients are evenly distributed throughout the mix to get the desired consistency. It is important to follow the instructions on the recipe for the mixing time and speed. If batter-type cake is mixed at high speed for too long a period of time, too much air will be incorporated, causing it to fall during baking. Sufficient air will not be incorporated when it is undermixed, resulting in a heavy cake. Angel food cake is not mixed in the way as batter-type cakes because it is necessary to incorporate more air into the mix to obtain the desired volume.

Batter type. There are a number of ways to mix batter-type cakes, but the most preferred is the two-stage method. This method is simpler and less subject to error. When mixing batter-type cake, there should be just enough batter in the mixing bowl to cover the paddle. After the cake is mixed, the batter should be between 72° and 78°.

In the two-stage method of mixing cake batters, part of the ingredients are mixed in the first stage, and the other ingredients are added and mixed in during the second stage.

Stage 1. Sift all dry ingredients together twice. Place the dry ingredients, shortening, milk, and the main portion of water into the mixing bowl. To avoid splashing, mix at low speed until all ingredients are combined. Once the ingredients are blended, mix for 3 minutes at medium speed and then scrape the bowl down thoroughly.

Stage 2. Combine the eggs, remaining water, and flavoring and add slowly to the ingredients already mixed in the bowl while mixing at low speed. After this has been done, stop your mixer (shut it off for the sake of safety), again scrape the bowl thoroughly, and then mix for 3 minutes at medium speed.

Angel food. When mixing angel food cake, you should not have enough batter in the mixing bowl to cover the wire whip. Too much batter in the mixing bowl could cause you to overmix it when adding the flour.

Angel food cake is prepared from egg whites, granulated sugar, salt, flavoring, cream of tartar, and flour. The egg whites should be fairly cool (approximately 70° F.) for whipping. Before attempting to whip egg whites, you must be sure the bowl and whip you use are free of any oil or grease. Should one of these utensils have a spot or streak of oil or grease on it, the egg whites will not whip. Place egg whites, salt, cream of tartar, and flavoring in the clean bowl and, with the clean whip, beat these ingredients until they are foamy. Add approximately one-half the granulated sugar (which must also be grease and oil free) in a slow stream and beat to a wet peak. *Do not* beat egg whites to a dry peak, as this will cause your cake to collapse in the oven while baking. To test for wet peak, stop your mixer, dip your index finger into beaten egg whites, and get a small amount out of the bowl. The properly beaten egg white mixture should form a peak and feel moist. Once the egg whites are properly beaten you *gently* fold in the flour and granulated sugar which have already been sifted together five times. Fold or mix *only* until the sifted flour and sugar are evenly distributed throughout the mix.

Exercise (033):

1. What are the two types of cakes mixed in the bakery?

034. Describe the proper technique used to check cakes for doneness.

Cake Baking. A baker should know that a good habit to get into at the start of the duty day is to turn the oven on to the desired temperature for baking the first item. By doing this first, you know the oven will be at the correct temperature when the item is ready to be baked. The cake batter must be scaled or measured into the pans which have been properly prepared. Do not place pans too close to each other or to the sides of the oven. Space pans evenly so that the heat can circulate around each pan. To tell whether or not a cake is done, press in the top with your fingers (about 1/16 of an inch). If the cake springs back it is done. But if your fingers leave an indentation or the cake sinks slightly, it should be baked a few minutes longer. After a cake is baked and removed from the oven, it should be allowed to cool for about 10 minutes before removing from pan.

The following is a list of some cakes, baking temperature and time. You can see that all of these cakes are baked at the same temperature, but the length of time they are baked will vary, depending on the size of cake made.

a. Angel Food Cake	375° F.	Loaf pan	30 minutes
b. Applesauce	375° F.	Sheet pan	35 to 40 minutes
c. Yellow	375° F.	Sheet pan	30 to 35 minutes
		9 inch pan	25 to 30 minutes
d. Chocolate	375° F.	Sheet pan	30 to 35 minutes
		9 inch pan	25 to 30 minutes
e. Devil's Food	375° F.	Sheet pan	30 to 35 minutes
		9 inch pan	25 to 30 minutes

Exercises (034):

1. What is the proper technique used to check cakes for doneness?

035. Identify common faults which occur when cakes are baked and state their probable causes.

When the finished product of a batter-type cake is not of the desired quality, the fault is usually with the person mixing the cake. This is why it is important to follow the recipe for proper mixing and baking procedures.

Batter-Type Cakes. The following is a list of faults and probable causes that will affect the quality, texture, and color of batter-type cakes:

a. Fall during baking. Excessive amount of shortening, leavening, or sugar and too little eggs or water.

b. Crust too thick. Excessive amount of sugar, improper baking, and baking pans too deep.

c. Too tough. Insufficient amount of sugar, shortening, and too many eggs.

d. Crust too dark. Too much sugar and improper baking.

e. Coarse grain. Excess sugar or leavening, improper mixing, and oven temperature too low.

f. Spots on top crust. Sugar too coarse and improper mixing.

Angel Food Cakes. We now list some faults and probable causes that will reduce the quality of angel food cakes:

a. Crust too thick. Thick crust may be caused by overbaking or baking at a temperature that is too high or too low.

b. Egg whites do not beat properly. Grease in mixing bowl or on beater, poor quality of egg whites, or mixing bowl too large for the amount of whites being beaten.

c. Crack on top. Too much flour in the recipe, overbeaten egg whites, oven temperature too high.

d. Crust too dark. Overbaking or excess oven heat will result in a dark crust.

e. Coarse grain. Overbeaten egg whites and batter mixed at high speed.

f. Unevenly baked. Improper mixing and uneven heat in oven.

g. Off color. Inferior ingredients, not enough acidity in batter, and tin rubbed from mixing bowl during mixing process.

h. Pale crust. Too much flour or not enough sugar, improper mixing, and baking in a oven that is too cool.

In the above paragraphs we discussed faults and probable causes that you may encounter when making cakes. Some of the causes can be corrected by adjusting the amount of a particular ingredient. The responsibility for adjusting these ingredients belongs to the shift leader or the supervisor. However, you can eliminate many faults by accurate scaling and following recipe instructions. Similar ingredient adjustments can be made with cookies, pies, and yeast doughs.

Exercises (035):

1. A batter-type cake that has a dark crust has too much _____ and was baked _____ .

2. Spots on top of a batter-type cake mean that the sugar was too _____ and the cake was _____ improperly.
3. If an angel food cake cracks on top, it is a good sign that the egg whites were _____.
4. An angel food cake that is unevenly baked was _____ improperly or the heat in the oven was _____.

036. State why cakes are finished after baking.

Finishing. Most cakes are iced, glazed, or dusted with powdered sugar. This adds to the flavor, eye appeal, and keeping quality of the cake. It is important that a cake be properly cooled before icing. Never ice a cake that is still warm, because the icing will melt and spoil the appearance of the cake.

Exercises (036):

1. Why are cakes finished after baking?

4-4. Cookies

Cookies make an excellent desert when served with ice cream, fruit, or pudding. The two basic types of cookies are the soft batter and stiff batter. Almost all cookies are prepared using four basic ingredients: flour, sugar, shortening, and liquid (milk and/or eggs). The proportions of these ingredients will determine whether the cookie will be hard or soft.

037. Identify the types of cookies mixed in Air Force bakeries.

Mixing. Generally, two methods are used for mixing cookies. These are the one-stage method and the creaming method. We will discuss the creaming method.

When mixing cookies by the creaming method, add shortening, sugar, and salt to mixing bowl and cream together. The eggs are added in two stages, scraping the bowl down after each stage. Once this is done, about half of the water and all of the dry ingredients (flour and baking powder) are added. Mix at low speed until all ingredients are combined and a smooth dough is formed. If the dough is not at the desired consistency, add small amounts of water until desired consistency is reached. When adding additional water, be careful not to mix the cookie dough for a prolonged period. Overmixing will cause the cookie to be tough and spread very little while baking.

Makeup. Now that you have the soft or stiff-batter cookies dough made, the next step is to prepare the cookies for baking.

Stiff-batter. After you have put the stiff-batter cookie dough on the work bench for makeup, handle it as little as possible. Overworking the dough will cause the finished product to be tough. For makeup, take a large handful of the dough and hand roll it to a diameter of approximately 3/4 of an inch. Cut the roll of cookie dough into pieces about 1 inch long. Now place the pieces of dough on a baking sheet and flatten. when placing a stiff-batter cookie on the baking sheet, always place the cut end of the cookie down. When this is done, the cookie will be round when flattened (fig. 4-2).

Soft-batter. Soft-batter cookies contain more moisture than stiff-batter cookies, and because of this extra moisture a spoon or pastry bag is used to drop them on a baking sheet. To keep the cookies uniform in size, extreme care must be taken when dropping them onto the baking sheet (see figs. 4-3 and 4-4).

Exercise (037):

1. State the types of cookies mixed in Air Force bakeries.

038. State when cookies should be removed from the oven.

Baking Cookies. After the cookies are placed on the baking sheet, they are ready to be baked. Remember, the oven should always be preheated to the desired temperature before attempting to bake any pastry items. It is best to remove cookies from the oven slighly *underbaked,* because the heat retained in the pan will finish baking them. When cookies are overbaked, they are dry and lose their flavor rapidly.

The following is a list of some cookie baking temperatures and times.

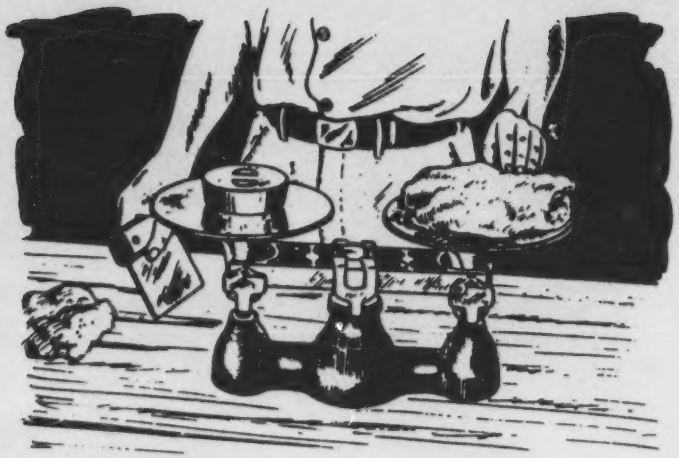
a.	Peanut Butter Cookies	375° F.	14 minutes
b.	Oatmeal Cookies	375° F.	10 minutes
c.	Sugar Cookies	400° F.	10 minutes

Exercises (038):

1. When should cookies be removed from the oven?

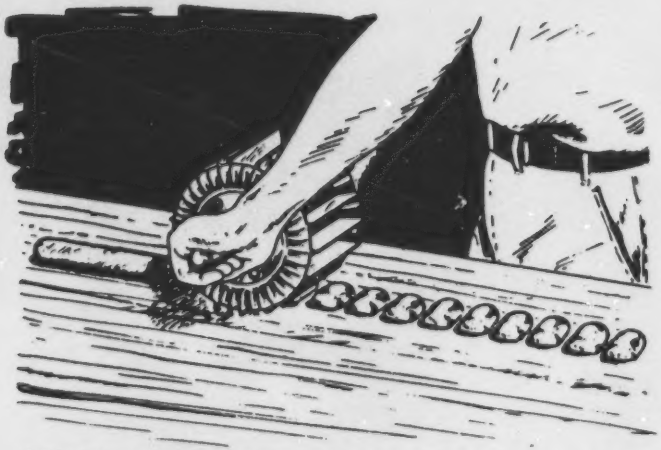
039. State how cookies may be finished.

Finishing Cookies. Icing cookies is not necessary, although it may add eye appeal. Before baking



1. Scale dough.

2. Roll dough into cylinder.



3. Cut cylinder into small pieces, either with a squirrel cage cutter or by hand.

4. Place pieces on baking sheet and flatten.

Figure 4-2. Makeup of stiff-dough cookies.

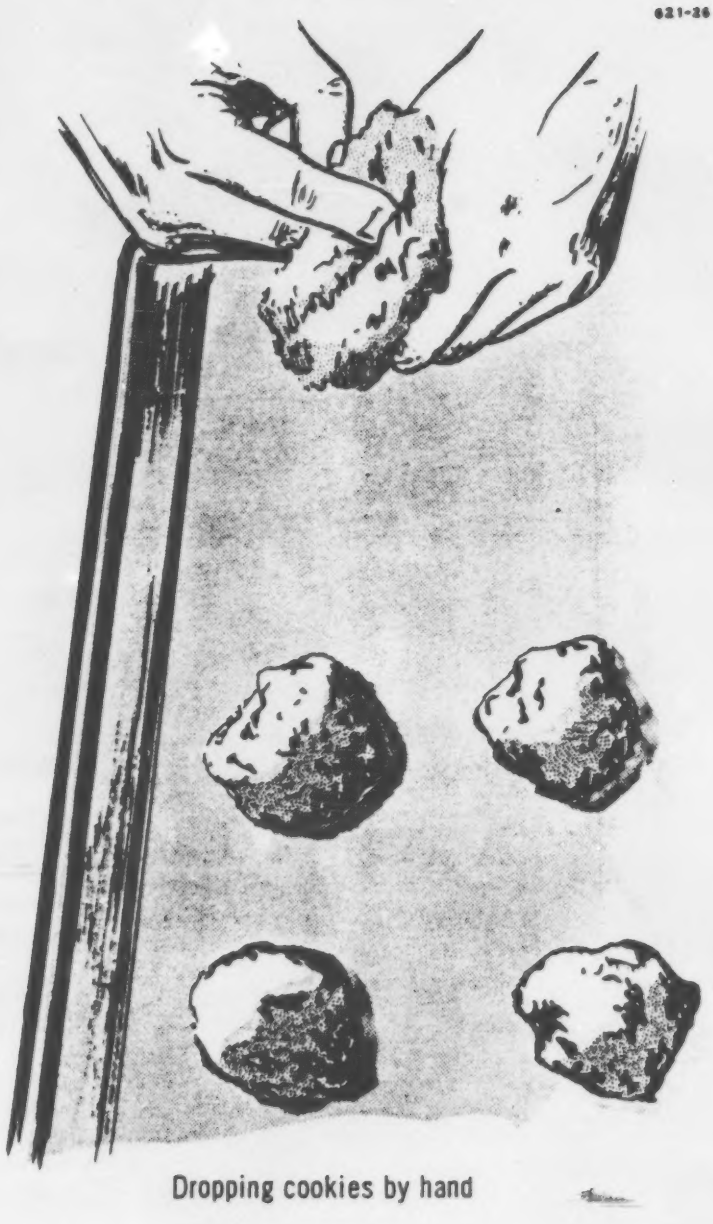


Figure 4–3. Dropping cookies by hand.

Figure 4–4. Dropping cookies by bag.

cookies you may garnish them with sugar, nuts, or raisins. You may ice cookies with different colored icing or use a white icing and dip in colored coconut.

Exercises (039):

1. List the ways in which cookies may be finished.

040. Identify common faults which occur when cookies are baked and state their probable causes.

Cookies Faults and Causes. Cookies, like pastry items, may show faults after they are baked. The following is a list of some of these faults and their probable causes:

a. Cookies lack spread. Wrong type of sugar, improper mixing, pans not prepared properly, overworking dough, and baking in an oven that is too hot.

b. Cookies spread excessively. Wrong type of flour, excessive amount of tenderizing material (sugar, shortening, or eggs), excessive pan grease, and baking in an oven that is too cool.

c. Off flavor in cookies. Faulty ingredients, baking on dirty pans, overbaking, and too much or wrong type of leavening.

d. Poor keeping qualities. Lack of moisture-retaining ingredients (honey, molasses, and brown sugar), and improper storage.

Exercises (040):

1. Cookies will lack spread if you use the wrong type of _____ .
2. By working cookie dough excessively, the cookies will _____ _____ .
3. Excessive pan grease will cause the cookies to _____ _____ .
4. Too much of a leavening agent will cause cookies to have an _____ _____ .

5. Lack of moisture retaining ingredients will cause cookies to have _____ _____ _____ .

4-5. Pie Dough (Crust) and Pie Filling

041. State the three basic types of pies.

A quality pie depends on two things, a proper filling and a tender crust. Pies are of three basic types; double-crust fruit pies, single-crust custard pie, and single-crust cream pie. When making double-crust fruit pies and single-crust custard pies, the raw filling is put into the pie shell and baked at the same time. When making single-crust cream pies, the crust is prebaked and the cream filling is cooked separately and put into the shell. Pies prepared in prebaked shells (cream pies) are often topped with meringue or whipped topping.

Exercises (041):

1. List the three basic types of pies.

042. Identify the method used to mix pie dough.

Pie Dough Mixing Method. Mixing pie dough correctly is very important because it is very easy to overmix. Overmixing pie dough will cause it to be tough and rubbery. When making pie dough, it is best to use chilled ingredients. If this is not possible, use ice water. When the ingredients (except water) are put into the mixing bowl, they should be mixed until lumps about the size of marbles are obtained. The water is then added and mixed enough to form a dough.

Exercises (042):

1. How is pie dough mixed?

043. Given partially completed statements regarding the rolling of pie dough, insert the missing information to make the statement correct.

Pie Dough Rolling Methods. The next step in making pies is rolling the dough out to the desired diameter and thickness. There are two pie dough rolling methods: hand rolling and machine rolling.

Hand rolling. Take a piece of dough (approximately 8 ounces) and form it into the shape of a hamburger bun. Dust a small area of the work bench and place the piece of dough on the dusted area. Place the rolling pin in the center of the dough piece and roll back and forth until the dough is about 10 inches long. Turn dough piece over and at right angle to the first line of direction and roll until the dough piece is about 1/8 of an inch thick and large enough to fit the pie tin (fig. 4-5).

Machine rolling. Dough that is to be machine rolled should be rather firm. The dough should be mixed in advance and chilled slightly. Before dough is machine rolled, it must be scaled into pieces weighing 8 ounces for bottom crust and 6 ounces for top crust. These pieces of dough also must be in the shape of a hamburger bun. The pieces of dough are then dusted with hard wheat flour and run through two sets of rollers, from which they emerge the desired thickness and diameter. The pie dough rolling machine was shown earlier in figure 3-3.

Exercises (043):

1. The dough to be hand rolled should be approximately _____ ounces.
2. The dough is rolled back and forth until it is about _____ inches long.
3. The rolled dough should be _____ of an inch thick.
4. Dough that is to be machine rolled should be _____ .
5. The bottom crust should weigh _____ ounces.
6. The top crust should weigh _____ ounces.

044. Given true and false statements pertaining to the panning of double-crust pies, identify each statement as being true or false.

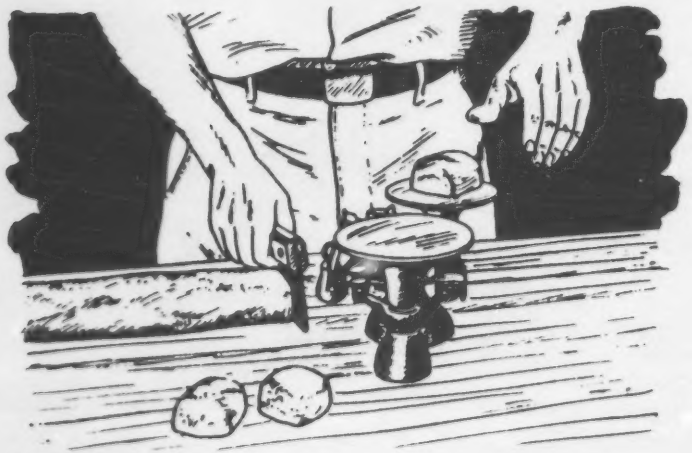
Panning Double Crust Pies. When the pie dough is rolled out, it should be handled carefully (not stretched) and placed in clean ungreased pans.

Bottom crust. Now that the pie dough is rolled out to the correct size and thickness, fold it in half to form a semicircle, place it over one-half of a pie tin so that you have about 1 inch of pie dough hanging over the edge. The dough piece is then unfolded to cover the other side of the pan. When the pan is covered, air will likely be under the dough piece. Gently remove the air by picking up the pan and tapping it on the table or use a piece of dough or your hand to press out the air. Now the pie shell is ready to be filled and covered with the top crust.

Top crust. Before filling the pie shell, wash the edge with water or a milk and egg mixture (fig. 4-6, A). This will make the top and bottom crust stick

A. Cutting dough mass into large pieces.

B. Rolling large piece into a cylinder.



C. Scaling dough.

D. Rolling dough

Figure 4 5. Rolling pie dough by hand.

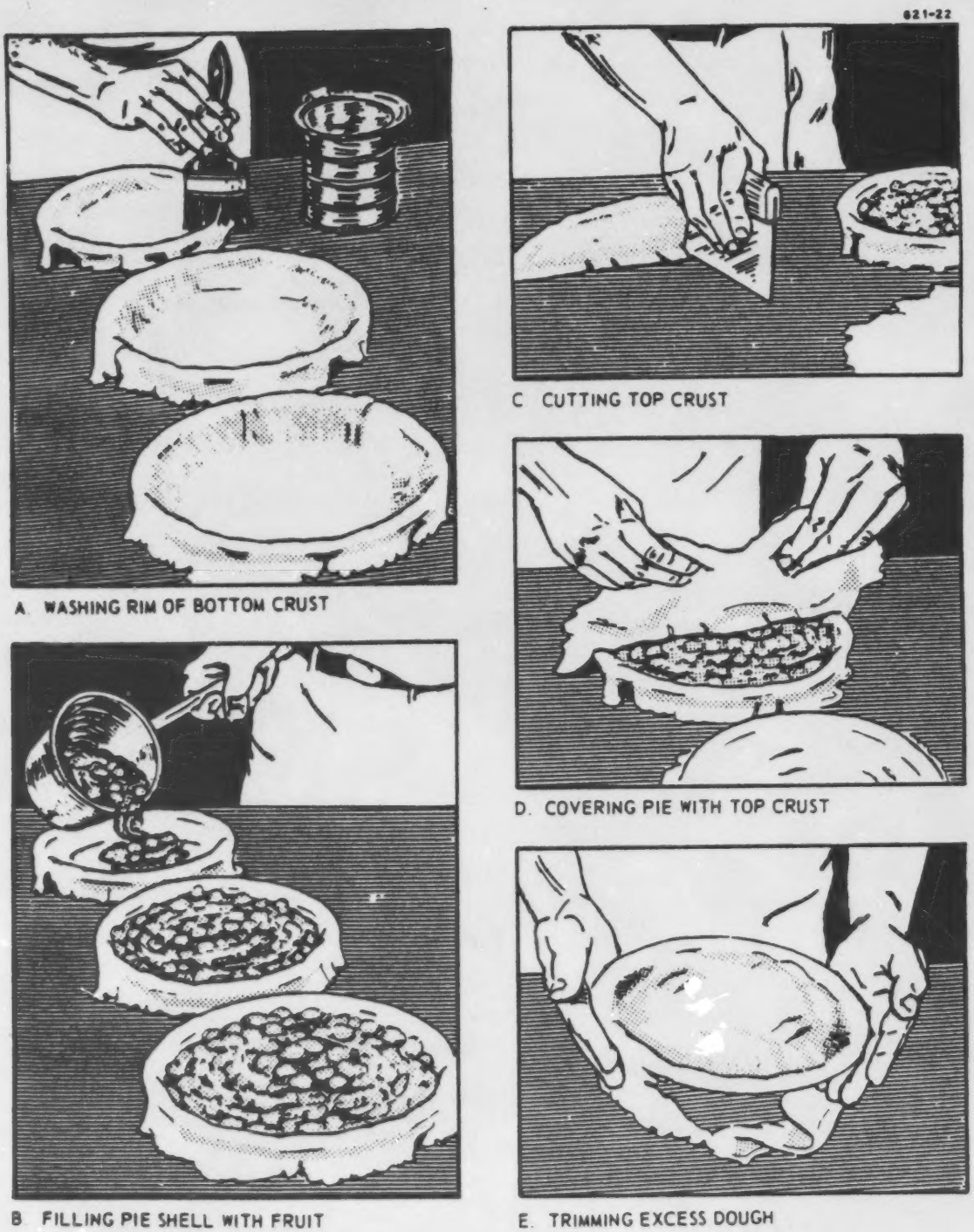

021-22
A. WASHING RIM OF BOTTOM CRUST
B. FILLING PIE SHELL WITH FRUIT
C. CUTTING TOP CRUST
D. COVERING PIE WITH TOP CRUST
E. TRIMMING EXCESS DOUGH

Figure 4-6. Making double-crust pies.

together and prevent the pie from boiling over during baking. After filling the pie (fig. 4-6, B), take one of the dough pieces for top crust and roll it the same as the bottom piece. Fold in half and make about six 1/2-inch cuts about 1/2-inch apart on the folded edge near the center (fig. 4-6, C). The purpose of the cuts in the top crust is to let steam escape from the pie filling during baking. Place the fold of the top crust as near the center of the pie as possible. Unfold the top crust to cover the exposed half of the pie filling (fig. 4-6, D). Press down around the rim of the pie with your hand so that the top and bottom will stick together. To trim the edge of the pie, press the palms of your hands against the rim of the pie tin and turn the pie until the excess dough is trimmed off (fig. 4-6, E). To give the pie a golden brown color, wash the top crust with a mixture of egg and milk or sugar and water. You should not wash the outside edge of the pie because here the crust is thin and the wash can cause it to burn before the rest of the pie has finished baking.

Exercises (044):

1. State whether the following statements are true (T) or false (F).

   a. Double-crust pies are placed in lightly greased pans. ___
   b. Gently remove the air when panning bottoms by pushing down the dough with your fingers. ___
   c. Before filling, the pies the edges of the shell should be washed. ___
   d. The top crust must have holes in it so that steam can escape. ___
   e. Before the pie is baked, the entire top is washed. ___

045. State the two methods used to prepare pie filling and state which one is the preferred method and why.

Pie Filling Preparation. We have discussed how pie dough is mixed, rolled out, placed in the pan and how to cover and trim pies, we will now explain how pie filling is prepared. Extreme care must be taken when preparing pie filling. Improper preparation can result in lumps of starch, or a filling that is too thick or too thin.

When preparing cooked fruit filling with cornstarch as a thickening agent, it should be prepared in advance so that the filling will be cool before it is placed in the pie shell. When pies are made with hot filling, wet or raw spots will occur in the bottom crust. Also, fillings, if hot, will boil out during baking. To prepare this type of filling:

a. Drain juice into steam kettle.
b. Add water to juice if more liquid is required.
c. Dissolve cornstarch in a portion of the liquid.
d. Bring liquid in steam kettle to a boil.
e. while stirring, add cornstarch mixture slowly and continue cooking until thick and clear.
f. Add sugar, salt, and other seasonings to hot mixture and stir until dissolved.
g. Pour the cooked mixture over the drained fruit and blend carefully so that fruits are not crushed.

When preparing filling using pregelatinized starch, follow these steps:

a. Drain fruit.
b. Add water to juice to obtain the required volume.
c. Blend all ingredients (dry) in a bowl.
d. Add juice gradually to dry ingredients and mix until smooth.
e. Carefully fold drained fruit into thickened mix.

The use of pregelatinized starch has a number of advantages over cornstarch. A batch of filling can be prepared in minutes as opposed to hours required to cook and cool conventional fruit fillings. Since there is no cooking required, there is no loss through evaporation. Thus, you will have 6 to 12 percent more filling.

Exercises (045):

1. List the two methods of preparing pie filling and state which one is the most preferred method and why.

046. Identify common faults which occur when pies are baked and state their probable causes.

Pie Crust and Pie Filling Faults and Causes. The following is a list of faults you may find in pies and pie filling. It is important to know these faults and causes because it will enable you to make necessary corrections more readily.

a. Crust shrinks excessively. Undermixing in first step, overmixing in final step, stretching the dough, the use of too much scrap dough.
b. Tough crust. Too much water, shortening that is too stiff, not enough shortening.
c. Soggy crust. Too much shortening, wrong type of flour, hot filling.

d. Crust sticks to pie tin. Boiled-over filling, new, wet, or dirty pie tins.

e. Crust lacks color. Inadequate heat in oven, top of pie not prepared correctly before baked, not enough milk or sugar.

f. Fruit boils out. Too much filling in pie, hot filling, a lack of holes in top crust, and a cool oven.

g. Filling tastes flat. Filling lacking salt or fruit acid.

h. Filling too thin. Undercooked filling, not enough starch.

i. Filling too thick. Excess starch, overcooking, insufficient sugar, lack of juice or water.

Exercises (046):

1. If pie dough is overmixed in the final step, it causes the crust to _____ .
2. Too much water will cause the dough to be _____ .
3. Hot pie filling will result in a _____ _____ .
4. Inadequate oven heat will result in the crust's _____ _____ .
5. Overbaking a pie can cause the filling to be _____ _____ .

4-6. Yeast Dough

Items made from yeast dough are no more difficult than other types of pastry, but require more time because of the necessity for fermentation and proofing. Once mixing has begun, the process cannot be interrupted without damage to the finished product.

047. State why overmixing of sweet dough must be avoided.

Mixing Yeast-Raised Dough. After the ingredients are acurately scaled and prepared in the appropriate manner, you are ready to mix the ingredients into a dough. Thorough mixing of the dough is necessary to distribute the yeast cells throughout the dough, distribute yeast food, free the dough of ingredient lumps, and form and develop the gluten. For the satisfactory development of gluten, all particles of flour must be thoroughly wet. Mixing brings moisture into contact with the gluten, forming proteins in the flour. As the mixing continues, all dough ingredients stick together and gluten continues to be formed until a complete gluten network is developed in the dough. Overmixing must be avoided because the dough will become very sticky and lack elastic properties, thus producing an inferior product. The time and speed for mixing doughs is on the recipe card of the particular item being made.

Exercise (047):

1. Why should you avoid overmixing sweet dough?

048. Identify the four types of fermentation that take place during the fermentation of yeast doughs.

Fermentation. In the following paragraphs we discuss the fermentation and proofing of yeast-raised dough. Regardless of the type of yeast-raised dough being made, the fermentation and proofing process is the same, but the fermentation and proofing time may vary.

Fermentation starts immediately after yeast is put into the mixture. The chemical changes continue until the yeast is killed by the heat of the oven. As generally used, the fermentation period is the time between mixing and dividing the dough for makeup. Punching the dough is included in this period.

Leavening the dough is the primary purpose of fermentation. Leavening is the result of chemical action that creates carbon dioxide gas in the gluten network that expands and causes the whole dough mass to expand.

Maturing, or ripening the dough, is the secondary purpose of fermentation. This is the result of changes in the gluten which cause it to stretch more effectively. This secondary action makes the dough more spongy and results in a light, easily digested food.

There are four types of fermentation which occur with yeast doughs. These types are alcoholic, acetic, lactic, and butyric. Alcoholic is the most desirable type. To insure a predominantly alcoholic type of fermentation, it is best to have doughs come out of the mixer between 78° and 82° F. If, because of uncontrolled factors of weather or equipment, a dough is mixed at a higher temperature, an edible product may still be produced by shortening the fermentation period. If doughs are mixed and fermented at relatively high temperatures and for long periods of time, other than alcoholic fermentation may predominate, thus producing an inferior product.

When mixing is completed, the dough is placed in a container approximately three times its size. This seemingly excessive amount of space is needed for the dough to rise during the fermentation period.

The container should be greased lightly to prevent the dough from sticking. After the dough is put into the container, cover the container with a clean apron or paper. Covering the dough will prevent a hard crust from forming on the top. You should find a warm draft-free area in the bakery where you can place the container of dough. Heat is important when making yeast-raised dough because heat, along with sugar, is what makes the yeast ferment during the fermentation period. Cold, drafty areas will retard the fermentation process and possibly cause damage to the dough. In bakeries where a fermentation room is available, the dough will be placed in it until it is ready for makeup. The fermentation room has control valves that will keep the temperature at 80° F. and the relative humidity at 75 percent. This combination is ideal for the fermentation of dough.

Exercises (048):

1. State the four types of fermentation that take place in the fermentation of yeast dough.

049. State the correct method for punching sweet dough.

Punching Dough. The fermentation time for yeast-raised dough is approximately 90 minutes. To determine whether or not the dough is ready to be punched, stick your fingers gently into the dough about 2 inches (fig. 4-7, A). If the dough begins to sink around the depression, (fig. 4-7, B) it is ready to be punched. However, when the indentation caused by the fingers tends to spring back, the dough is not ready, and should the dough fall rapidly, the proper time for punching has already passed and it should be punched and made up at once. The correct way for punching dough is to press the center down and fold the sides of the dough in toward the center (fig. 4-7, C) until most of the carbon dioxide gas is expelled. The dough is then allowed to ferment for a period of 15 to 30 minutes before makeup.

Exercises (049):

1. How is sweet dough punched?

050. Identify the ingredients other than dough used in the makeup of cinnamon rolls.

Cinnamon rolls. For cinnamon rolls, the dough is cut into pieces weighing about 5 pounds each. They are then molded into an elongated form (about 18 inches long) and given a short relaxing period. A dough piece is then rolled out with a rolling pin until it is about 1/4 of an inch thick and about 16 inches wide (fig. 4-8, A). The rolled-out dough piece is then painted with melted butter or margarine (fig. 4-8, B). A cinnamon and sugar mixture is then sprinkled over this dough after which raisins are sprinkled (fig. 4-8, C). Then start from the farthest side of the dough (fig. 4-8, D) and roll it into a tube shape approximately 2½ inches in diameter. This piece of dough is then cut crosswise (fig. 4-8, E) into pieces about 3/4 of an inch long and then placed on a sheet pan.

Exercises (050):

1. What ingredients are added to the dough in the makeup of cinnamon rolls?

051. State why sweet rolls must have a proof period before they are baked.

Proofing and Baking. After cinnamon rolls are made up, they must be allowed to proof (rise in the pan) until they are approximatley double in size prior to baking. The temperature of the proofing cabinet should be maintained from 90° to 100° F., and the relative humidity at 80 to 85 percent. Extreme care must be taken when handling proofed rolls, since jarring could cause them to fall. Cinnamon rolls are best baked at 400° F. for 15 to 20 minutes.

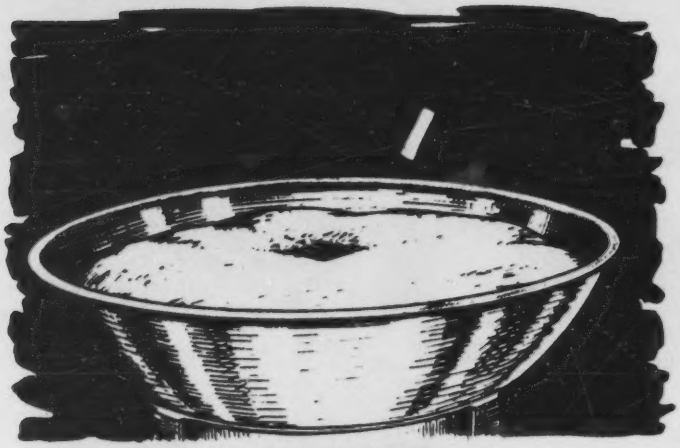
Exercises (051):

1. Why must sweet rolls have a proof period before they are baked?

052. Indicate common faults which may occur when baking sweet rolls and their probable causes.

Yeast Dough Faults and Causes. The yeast-raised items which you have produced may not always meet the required standards of quality. For this reason, we will list some of the faults you may encounter and their causes. It is most important that you follow instructions given in the recipe and scale the ingredients carefully.

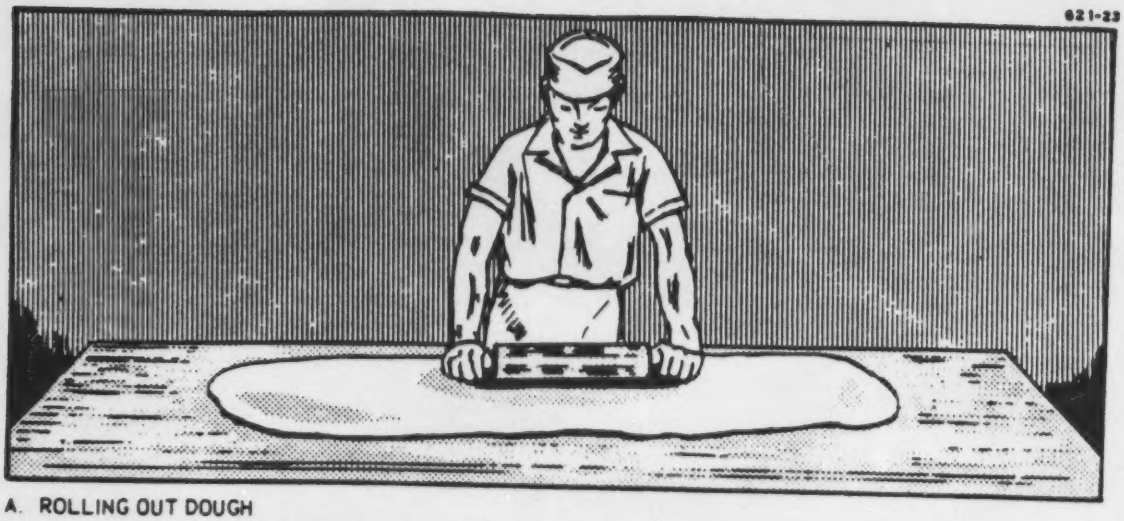
A. Testing for punch



B. Receded dough, after test

C. Folding the dough after it has receded

Figure 4-7. Punching yeast-raised dough.

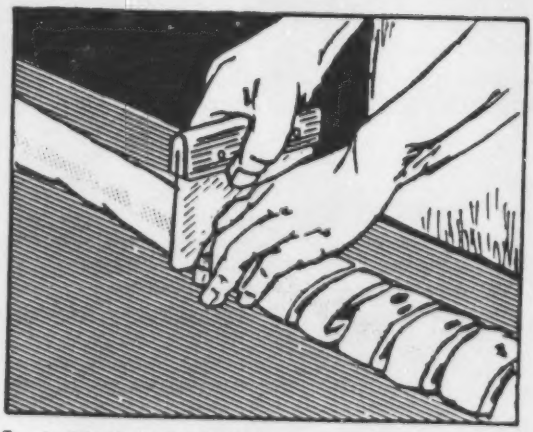


A. ROLLING OUT DOUGH

B. BUTTERING THE ROLLED DOUGH

D. ROLLING INTO A CYLINDER

C. ADDING SUGAR AND RAISINS TO THE DOUGH



E. CUTTING THE DOUGH BY HAND

Figure 4-8. Preparing cinnamon rolls.

a. Lack volume. Too much salt, dough too old, too young, too stiff, underproofing dough, and item knocked down after proofing.

b. Too much volume. Insufficient salt to control yeast, overproofing dough, and oven is too cool.

c. Pale crust. Lack of sufficient sugar, shortening, or milk, use of old dough, and oven too cool.

d. Dark crust. Excessive amounts of sugar or milk, use of a young dough, and flash heat in the oven.

e. Crust too thick. Excessive sugar, use of old dough, and overproofing.

f. Tough crust. Lack of shortening, salt, or sugar and use of old dough.

g. Poor texture. Lack of sugar, shortening, or milk, dough too stiff, and use of too much dusting flour.

h. Acid or flat taste. Lack of salt in the dough, old dough, and too little salt or sugar.

Exercises (052):

1. Too much salt will cause the dough to _____, _____ .
2. If the oven is too cool, the dough will have too much _____ .
3. If the oven is too cool, the dough crust will be _____ .
4. Too much sugar will cause the dough to have a _____ crust.
5. Lack of shortening will cause the crust to be _____ .
6. Using too much dusting flour could give the dough poor _____ .

CHAPTER 5

Air Force Supply Discipline

THIS CHAPTER deals with three particularly important phases of food service operation—inspection, storage, and accounting of subsistence supplies. The intelligent application of the prescribed inspection procedures before food items are accepted from the producer or shipper insures against spoiled, contaminated, and inferior food products coming into Air Force food service establishments. Sensible and adequate storage procedures, together with continued inspection, insure against unfit food reaching the serving line or table.

Everyone in a food service operation must be familiar with proper inspection, storage, and accounting procedures. Personnel who have been awarded food service AFSCs have well-defined responsibilities for applying and enforcing such procedures.

5-1. Safeguading Food Supplies

The chief purpose for the inspection of food supplies is to safeguard the health of Air Force personnel. Another purpose for the inspection of food is economy. Money spent on inedible or inferior food supplies is a waste and a drain upon the food budget of the Air Force. A further purpose is morale. The final inspection of food, and in some respects, the most important one, is by the consumers—the airmen who eat in the dining hall.

053. State the types of inspections you are expected to perform in the bakery and list the reason or reasons for each inspection.

Inspections fall into three categories: quality, quantity, and condition. Food itself is divided into two categories: perishables, and nonperishables. Thus, we have quality, quantity, and condition inspections of perishable and nonperishable subsistence.

Quality Inspections. Quality inspections are accomplished at the suppliers plant or warehouse by trained Government inspectors. A further quality inspection is performed by the base veterinarian. Only highly trained specialists should perform quality inspections of food supplies. Food service personnel are neither required nor expected to perform these inspections.

Quantity Inspections. Quantity inspections are required each time an Air Force activity receives food supplies. The purpose of such inspections is to insure that the amount of subsistence received is the amount indicated on the receipt. Such inspections are particularly important at the commissary, bakery, and dining hall levels. The failure to make a thorough quantity inspection can result in unpleasantness, unnecessary work, and much red tape.

A great amount of food received at a food service facility is in metal, paper, or cardboard containers. The containers should be checked to insure that the actual quantity of food in the container agrees with the amount indicated on the label and to make certain that no containers, packages, or cartons are broken.

Quantity inspections are to be made when food supplies are first received into the bakery. NEVER sign for any supplies until the inspection is made and agrees with the receipt.

Quantity inspections of food supplies in storage are also made periodically. These inspections are normally known as inventories, but the purpose is the same—to determine the amount of food supplies on hand.

Condition Inspections. Condition inspections are performed to determine if there is any change or deterioration of food from its original state or quality. These inspections are a definite responsibility of food service personnel. They require a great deal of knowledge and skill as well as attention to detail on the part of the person who performs the inspection.

Storage periods should be carefully controlled and frequent condition inspections made while food

MODIFICATIONS

Pages 71-76 of this publication has (have) been deleted in adapting this material for inclusion in the "Trial Implementation of a Model System to Provide Military Curriculum Materials for Use in Vocational and Technical Education." Deleted material involves extensive use of military forms, procedures, systems, etc. and was not considered appropriate for use in vocational and technical education.

is in storage. Food service personnel must make every effort to insure that food is not kept in storage beyond the recommended period. Periodic inspections of all food supplies are required after these supplies are received until they are either eaten or otherwise disposed of.

There are a number of ways in which food deterioration may be detected. Bulging or misshapen containers, discolorations, strange or unpleasant odors, and an "off" taste are some of the danger signals. Special attention should be given to dairy products, since they are in a highly perishable category. Canned and processed foods, though generally considered nonperishable, are also subject to deterioration and must be inspected.

Examine the outside of cans for holes, rust, swelling, and dents. Holes are usually indicated by leakage and discoloration of the cans label. The contents of a leaky can are almost certain to be spoiled. Rust on the outside of a can does not injure the contents of a can unless it has penetrated to the interior of the can. Dented cans must be inspected carefully to determine if the denting has caused a leak.

Food service personnel are expected to inspect for the freshness and cleanness of bottles and other containers. Chipped or broken bottles should be rejected, particularly if the chipping or breakage is around the mouth of the bottle.

When frozen foods are shipped, they must be held in their original frozen condition. Any evidence of thawing is cause for the commissary officer, with approval from the base veterinarian, to refuse acceptance of the item. From a bakery standpoint, any evidence of thawing is also a cause for rejection. Therefore, when you are inspecting packaged frozen food items, be on the alert for stained or discolored packages, which in many cases indicate that the food has thawed and was refrozen somewhere along the line. If there is any doubt about the condition of the item, the base food inspector makes the final decision.

Exercises (053):

1. List the three types of inspections you are expected to perform.

2. List the purpose of each inspection you listed above.

5-2. Storage Facilities

The baker's job has only started when the supplies reach the bakery. It then remains for him to make sure that these supplies are properly stored. Food service facilities are normally furnished with adequate storage space and facilities that, when properly used, largely insure against the deterioration of subsistence supplies if they are not kept in storage beyond the recommended time limits. After you receive subsistence, you must make sure the materials are stored properly.

When possible, a subsistence storeroom should be large enough to permit all food supplies, perishables and nonperishables, to be stored under one roof. Time and manpower can be saved and security requirements more easily met when such a condition exists.

In the paragraphs to follow we will speak first of the storage of nonperishables and then cover the storage techniques of cold storage (perishables).

054. Given incomplete statements regarding the storage of nonperishables, provide the missing information to make each statement correct.

Dry Storage Techniques (Nonperishables). The requirements for the storage of nonperishables are reasonably simple. The storage space should be cool, dry, clean, and well ventilated. It should be equipped with adequate shelves, racks, and dunnage (wooden mats or pallets on the floor). It should be reasonably insect and rodent proof. The storage area must always have provisions for securely locking all doors and windows through which entry may be made.

Supplies should be arranged so that those that have been on hand the longest are used first. This process is called rotating your stock. Unless this precaution is taken, the recommended maximum storage periods for the various food items may be exceeded, causing possible deterioration.

Open bags of flour, sugar, and similar dry stores keep best in cans with tight-fitting covers. Under no circumstances should opened packages be kept on the floor or in dark corners. This is because of the liklihood of insect infestation and because it increases the possibility of mold and rot.

The arrangement of food supplies in the storeroom should facilitate their receipt, issue, and repackaging, and protect them from deterioration. Meeting these requirements entails careful planning and adequate stocking and binning of supplies. Small items should be placed in bins or on shelves; larger items can be stocked on dunnage. Under no

circumstances should any supplies be placed directly on the floor.

A special problem is presented when it is necessary to store canned milk for extended periods. When canned milk is kept in storage for a prolonged period, there is a tendency for a fat-separation process to occur. You can retard this process by inverting the cans when they have been on hand for 30 days.

The points established in the preceding paragraphs apply to a normal operation. Some deviations are permitted and may be necessary in areas affected by extremes in temperature. If this is the case, the problem will have been recognized by responsible officials, and appropriate storage ground rules will have been established. Strict adherence to the local ground rules is required.

Exercises (054):

1. The storage area for nonperishables should be cool, dry, _____ and well _____ .
2. All storage rooms should have provisions for all doors and windows to be _____ .
3. When supplies are arranged so that the oldest is used first, it is called _____ your stock.
4. Under no circumstances should supplies be kept directly on the _____ or in _____ _____ .
5. Open bags of sugar keep best in _____ with _____ .
6. Canned milk presents a special problem because of a process which occurs in milk called _____ .
7. If storage ground rules are established, they must be _____ adhered to.

055. Given incomplete statements regarding storage of perishables, provide the missing information to make the statement correct.

Cold Storage Techniques (Perishables). The proper use of facilities and adherence to recommended procedures, in addition to preventing food spoilage, go a long way toward insuring the continued high value and quality of food. For this reason, all personnel should understand something about refrigeration and its proper use. The paragraphs to follow describe the various refrigerated storage facilities and their use.

The freezer is intended primarily for maintaining foods in their frozen state. The freezer is not to be used for the initial freezing of food items except under emergency conditions.

Food items that are received into the facility solidly frozen may be piled into compact stacks in the freezer. Those items that are received that are not solidly frozen should be stacked loosely so that the cold air can circulate around the items, thus bringing their temperature down to the proper storage levels. Frozen items received in a partially thawed condition should not be placed in the freezer. If they cannot be used at once, reject them.

There are certain refrigeration rules that must be followed when placing any item in the freezer. They are as follows:

a. Store food loosely. Loose storage permits the proper circulation of air.

b. Cover nonpackaged foods with paper or container covers. Covers reduce the absorption of foreign odors and add to the overall sanitation of the refrigerated space.

c. Avoid overcrowding. Overcrowding reduces air circulation and places a heavier load on the freezer.

d. Place new stock at the back of the freezer. This rotation of stock insures the use of the older items first and thus reduces the likelihood of spoilage.

e. Wash the refrigerator daily. Cleanliness holds down bacteria and reduces the chance of food spoilage.

f. Defrost the freezer before 1/4 inch of frost accumulates. Frost retards the cooling process and reduces the efficiency of the unit.

g. Open the door only when necessary and close it as soon as you have withdrawn or put in whatever you needed. When the door is opened, cold air is lost causing the temperature to rise and the unit to run more frequently. This also causes frost to accumulate faster.

Exercise (055):

1. The freezer is intended primarily for maintaining foods in their _____ _____ .
2. Food received into the bakery in a solidly frozen state may be _____ into _____ _____ in the freezer.
3. If frozen foods arrive into the bakery in a partially thawed condition and cannot be used immediately, they are to be _____ .
4. Loose storage of food permits the proper _____ of _____ .
5. Nonpackaged food should be covered with _____ or _____ .
6. New stock placed in the freezer should always be placed in the _____ .
7. Defrost the freezer before _____ has accumulated.

GLOSSARY

Absorption—Taking in by molecular action. The property of flour to absorb and hold liquid.

Aeration—Treating dough or batter by charging with air or carbon dioxide gas to increase volume.

Angel Food Cake—A fine white cake without shortening, made of egg whites, sugar, flavoring, and baked in a tube pan.

Bake—To cook by dry heat in a closed place, as in an oven.

Baking Powder—Chemical leavening agent composed of soda, edible acids, and usually cornstarch to absorb air moisture. When wet, this agent forms carbon dioxide gas to cause the batter to rise.

Baking, or Bicarbonate of, Soda—Sodium salt of carbonic acid having the ability to combine with acid to produce carbon dioxide gas. It is alkaline in nature.

Batter—Mixture of combined ingredients such as flour, sugar, eggs, shortening, and milk, thin enough to be poured or dropped.

Blend—Mixing of two or more flavorings or grades of flour; mixing of two or more ingredients, such as flour and shortening in the first step of making a pie dough.

Butter Cream Frosting—Rich, uncooked frosting containing powdered sugar, butter, and/or other shortening.

Cake—Leavened and shortened sweet product containing flour, sugar, salt, eggs, milk, liquid, flavoring, shortening, and leavening.

Cake Faults—Deviations from standards of perfection for the type.

Carbon Dioxide—Colorless and tasteless gas obtained during fermentation or by combining soda and acid.

Cream Filling—Cooked mixture of sugar, egg, milk, and thickener, used for pies and fillings.

Creaming—The process of combining sugar and shortening by mixing.

Cream Pie—Prebaked pie shell with a cream filling, topped with whipped cream or meringue.

Cream Puff—Baked cream puff dough with a hollow center filled with whipped cream, cream filling, or marshmallow filling.

Custard—Sweetened mixture of egg and milk cooked over hot water or baked.

Custard Pie—One-crust pie made by placing custard in unbaked pie shell and baking.

Dissolve—To change from a solid to a liquid; dissolved substances cannot be seen as particles or filtered.

Dough—Mixture of combined ingredients for pie crust, cookies, etc., stiff enough to be kneaded.

Dough Temperature—Temperature of dough at time of discharge from the mixer.

Drop Cookies—Cookies formed by dropping batter onto baking pans.

Dusting—Distributing a film of flour to prevent sticking of dough on worktable and makeup equipment.

Dusting Flour—Flour, generally hard wheat, used for dusting because of its special properties.

Evaporated Milk—Unsweetened canned milk from which a portion of the water has been removed before canning.

Expansion of Dough—Stage of dough production where air has been trapped by the gluten network to expand the dough.

Ferment—Substance, such as yeast, which causes fermentation.

Fermentation—Chemical changes to an organic compound, which are due to the action of living organisms (such as yeast), that result in formation of carbon dioxide, alcohol, and acid.

Flavor—Extract, emulsion, or spice used to produce a pleasant taste; the taste of the finished product.

Flour—Finely ground meal made from wheat or rye grain.

Foam—Mass of beaten egg and sugar, as in angel food cake, before adding flour.

Fold—To lap yeast dough over on itself. This is done after mixing and after punching.

Frosting—Mixture of sugar and other ingredients, such as shortening, egg whites, and flavoring, used to finish and decorate cakes.

Glaze—A cooked syrup used to put a shiny finish on pastry items.

Gliadin—That part of gluten which gives it elasticity.

Gluten—Elastic protein complex formed when water is kneaded with wheat flour.

Greasing—Spreading a film of fat on a surface.

Humidity—Moisture in the air.

Hydrogenated Shortening—Vegetable oil that has been convered to a solid shortening.

Ice—To apply frosting.

Ingredient Room—Separate room where ingredients are stored.

Ingredients—Food materials used to produce bakery products.

Inventory—Itemized list of goods and equipment on hand, together with the cost.

Leavening—Raising of dough or batter by air, steam or carbon dioxide.

Leavening Agent—Ingredients used to produce carbon dioxide in doughs and batters.

Makeup—Process of producing items from a large mass of dough.

Measuring—Apportioning ingredients by volume or weight.

Meringue—White, frothy mass of beaten egg whites and sugar.

Milk Solids—All of cow's milk except the water.

Mix—Combined ingredients of a batter or dough.

Mixing—Combining ingredients to the degree necessary to form batters and doughs.

Mixing Machine—Machine equipped with a bowl and various agitators, used for mixing doughs and batters.

Molasses—Light to dark brown syrup obtained as a byproduct in making cane sugar.

Mold—Tiny, visible vegetable organisms which cause the spoilage of bakery products.

Pans—Variously shaped metal containers used for baking tins.

Pastry Bag—Horn-shaped cloth bag used for tubing soft dough, frosting, etc.

Pie—Dessert with pastry bottom, fruit, cream, or custard filling and meringue, whipped cream, or pastry top.

Proof Box or Cabinet—Storage space where atmospheric conditions suitable for proofing of dough may be maintained.

Proofing Period—Time period prior to baking during which panned yeast products are allowed to approximately double in size.

Raisins—Dried sweet grapes, either dark or bleached.

Rounding—Shaping of dough pieces into firm balls with a smooth, unbroken skin over the entire surface.

Scaling—Apportioning batter or dough according to unit weight.

Schedule—Detailed plan of operation.

Shortening—The fat or oil used to make pastry brittle or crisp.

Sifting—Passing through a fine mesh for blending, aeration, or removal of foreign or oversize particles.

Texture—Interior grain or structure of a baked product, as shown by a cut surface; also, the feeling of a substance under the fingers.

Tubing—Pressing a substance through a decorating or other type of tube.

Wash—Liquid brushed onto the surface of an unbaked product to give a golden brown color to a crust. The liquid may be water, milk, starch solution, thin syrup, or eggs.

Whip—Beat to a froth; also, the instrument used for whipping, which consists of strong wires held together by a handle.

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ANSWERS FOR EXERCISES

CHAPTER 1

Reference:

001 - 1. 1. d.
2. e.
3. a.
4. b.

002 - 1. 62130.

003 - 1. 3.
003 - 2. 5.
003 - 3. 7.

004 - 1. Official.
004 - 2. Secret; Top Secret; Cofidential.
004 - 3. Top Secret.
004 - 4. Confidential.
004 - 5. Secret.

005 - 1. Secret.
005 - 2. For Official Use Only.
005 - 3. Confidential.
005 - 4. Top Secret.

006 - 1. Messenger; mail; telecommunication.
006 - 2. a. Reliability.
b. Security of the mode.
c. Speed of delivery.

006 - 3. a. (Adv) Most reliable; most secure. (Dis) Slowest.
b. (Adv) Reliable when Registered or Certified; secure in the U.S. (Dis) Slow delivery; only secure in U.S.
c. (Adv) Fast. (Dis) Unreliable; insecure mode.
d. (Adv) Fast; secure when ...oded. (Dis) Unreliable.
e. (Adv) Fast; secured whe... ...oded. (Dis) Unreliable.

007 - 1. Commander's call; telephone; radio.
007 - 2. (1) h. (6) e.
(2) b. (7) f.
(3) c. (8) j.
(4) d. (9) g.
(5) i. (10) a.

008 - 1. Good training, supervision.
008 - 2. Dual-channel, on-the-job.
008 - 3. Brief.
008 - 4. Supervisor.

009 - 1. 1. c.
2. b.
3. a.
4. e.

010 - 1. AFM 35-10 sets the guidelines for dress and personal appearance of Air Force personnel.

CHAPTER 2

011 - 1. Unsafe acts; unsafe conditions.

012 - 1. (1) Make certain machinery is properly grounded.
(2) Be aware of wet floors.
(3) Wear safety shoes.
(4) Wear proper clothing.
(5) Only fully trained authorized personnel should operate equipment.

013 - 1. (1) Unsafe operation of motor vehicles.
(2) Sports and recreation.
(3) Domestic.

014 - 1. 18.
014 - 2. Overhead; boxes
014 - 3. Shields; clamps
014 - 4. Metal container
014 - 5. Ash trays; sandfilled containers

015 - 1. To prevent dangerous concentrations of toxic or flammable gases around refrigeration equipment.
015 - 2. So that steam discharges will not endanger personnel.
015 - 3. To remove smoke and vapors.

016 - 1. (Male) 50 lbs.
(Female) 25 lbs.
016 - 2. Make sure that your path is clear of personnel and any other obstructions.
016 - 3. By a suitable mechanical device.
016 - 4. Lift from a squatting position, with the back straight; lift with the legs exerting the primary lifting force.

017 - 1. Fuel, heat, and oxygen.
017 - 2. The fire will be extinguished.

018 - 1. Accumulations of rubbish, waste, and industrial residue.

019 - 1. Adequate warning signs; never overload circuits; avoid excessive bending, stretching, and kinking of electrical cords; inspect cords regularly; have all faulty equipment repaired; mark all outlets with their voltage output; safety tie all cords to equipment; never use excessive water in the clean-up of the bakery and turn off all power leads to equipment prior to clean-up.
019 - 2. Continuously.
019 - 3. Have it replaced immediately by qualified electricians.
019 - 4. No.

CHAPTER 3

020 - 1. 163-8.
020 - 2. Medical personnel.
020 - 3. Definite standards.

65

021 - 1. Soap and water.
021 - 2. Mental; physical.
021 - 3. Any 10 items of *a* through *q* in the text segment.

022 - 1. Respiratory; intestinal; insect-borne.
022 - 2. Respiratory.
022 - 3. Intestinal.
022 - 4. Insect-borne.

023 - 1. a. Supervisor's inspection.
b. Medical services inspection.
c. Physical examination.
023 - 2. Physical examination.
023 - 3. To check: (any 3)

a. Personal appearance.
b. Cleanliness of the area.
c. Finger cultures.
d. Techniques used in preparation of pastry.
e. Washing facilities.

024 - 1. a. Dirt soluble in water.
b. Dirt not soluble in water.
c. Dirt that produces a stain.

024 - 2. Water.
024 - 3. Solvent; emulsifying agent.

024 - 5. a. Those emulsifying dirt with water.
b. Those removing dirt by abrasive action.
024 - 5. a. By dissolving the substance causing the stain.
b. By using a bleaching agent.
c. By absorbing the substance causing the stain.

025 - 1. a. Provides the necessary sanitation.
b. Protects the floor.
c. Adds to the attractiveness of the facility.

025 - 2. Clean them.
025 - 3. a. Wet mopping.
b. Damp mopping.

026 - 1. Flies and roaches.
026 - 2. a. Eliminate breeding places.
b. Screen windows and doors properly.
c. Use chemicals.
d. Eliminate their food supply.
026 - 3. a. Fill all cracks and crevices.
b. Eliminate breeding places.
c. Keep food covered.
d. Watch food deliveries.

027 - 1. To remove water from mops.
027 - 2. Place the wringer on the bucket; place the mop between the rollers; insert the mop in the wringer; turn the latch on the wringer toward the inner part of the bucket; turn the handle clockwise.
027 - 3. Do not use excessive amounts of water; remove plates first and wash them at the sink; using a soft brush or a clean rag, remove all flour from the machine; never use water on the rollers and never attempt to clean rollers when the machine is in motion.
027 - 4. A mild detergent.
027 - 5. Crack
027 - 6. A damp cloth and/or stainless steel polish.
027 - 7. The handles will rot or otherwise deteriorate from the constant expansion when wet and the contraction when dried.
027 - 8. Dry; bottoms; stacked.

028 - 1. In an outside locker located away from the bakery.
028 - 2. In storage racks.
028 - 3. They may become contaminated.

CHAPTER 4

029 - 1. 1. c
2. h
3. d
4. a
5. f
6. b
7. j
8. g
9. i
10. e

030 - 1. Structure builder.
030 - 2. Yeast food or a sweetener.
030 - 3. Frostings.
030 - 4. Soft; dissolve.
030 - 5. Particular flavor.
030 - 6. Chewy, crust.
030 - 7. Texture; sheen.
030 - 8. Fermentation.
030 - 9. Tender; flakiness.
030 - 10. Structure.
030 - 11. Crust color.
030 - 12. Soapy taste.

031 - 1. Heavy-duty scales and light, sensitive scales.

032 - 1. a. Use a shortening and flour mixture.
b. Use a salad oil and flour mixed.
c. Line the pans with paper.
d. Grease the pan with shortening and dust it with flour.

033 - 1. a. Batter type.
b. Angel food.

034 - 1. Press in the top of the cake about 1/16th of an inch. If the cake is done, it will spring back.

035 - 1. Sugar; improperly.
035 - 2. Coarse; mixed.
035 - 3. Overbeaten.
035 - 4. Mixed; uneven.

036 - 1. Finishing adds to the flavor, eye appeal, and keeping quality of the cakes.

037 - 1. a. Stiff-batter.
b. Soft-batter.

038 - 1. When they are still slightly underbaked.

039 - 1. They may be iced or garnished with sugar, nuts, raisins, or coconut.

040 - 1. Sugar.
040 - 2. Lack spread.
040 - 3. Spread excessively.
040 - 4. Off flavor.
040 - 5. Poor keeping qualities.

041 - 1. a. Double-crust fruit pie.
b. Single-crust fruit pie.
c. Single-crust custard pie.

042 - 1. Mix all ingredients except water until lumps about the size of marbles are obtained. Then, add water and mix enough to form a dough.

043 - 1. 8.
043 - 2. 10.
043 - 3. 1.8.
043 - 4. Firm.
043 - 5. 8.
043 - 6. 6.

044 - 1. a. False.
b. False.
c. True.
d. True.
e. False.

045 - 1. Pie filling can be prepared with cornstarch or with pregelatinized starch. The most preferred method is with pregelatinized starch. With this method a batch of filling can be prepared in minutes as opposed to hours required to cook and cool conventional fruit fillings. Since there is no cooking required there is no loss through evaporation; thus, 6 to 12 percent more filling is produced.

046 - 1. Shrink.
046 - 2. Tough.
046 - 3. Soggy crust.
046 - 4. Lacking color.
046 - 5. Too thick.

047 - 1. Because the dough will become sticky and lack elastic properties, thus producing an inferior product.

048 - 1. Alcoholic, acetic, lactic, and butyric.

049 - 1. Press the center down and fold the sides of the dough in towards the center.

050 - 1. Butter or margarine, cinnamon, sugar, and raisins.

051 - 1. So that they can rise in the pan until they are double in size.

052 - 1. Lack volume.
052 - 2. Volume.
052 - 3. Pale.
052 - 4. Dark.
052 - 5. Tough.
052 - 6. Texture.

CHAPTER 5

053 - 1. a. Quality.
b. Quantity.
c. Condition.

053 - 2. a. Quality: used to check the quality of the food.
b. Quantity: performed to insure that the amount of subsistence received is the amount indicated on the receipt.
c. Condition: to determine if there is any change or deterioration of food from its original state or quality.

054 - 1. Clean; ventilated.
054 - 2. Locked.
054 - 3. Rotating.
054 - 4. Floor; dark corners.
054 - 5. Cans; tight-fitting covers.
054 - 6. Fat separation.
054 - 7. Strictly.

055 - 1. Frozen state.
055 - 2. Piles; compact stacks.
055 - 3. Rejected.
055 - 4. Circulation; air.
055 - 5. Paper; covers.
055 - 6. Back.
055 - 7. One-fourth inch of frost.

056 - 1. AF Form 287.
056 - 2. AF Form 129.
056 - 3. To draw subsistence from the storeroom.
056 - 4. Four.

AU GAFB AL (793434)1300

STOP– **1. MATCH ANSWER SHEET TO THIS EXERCISE NUMBER.** **2. USE NUMBER 1 OR NUMBER 2 PENCIL.**

62130 01 22

EXTENSION COURSE INSTITUTE
VOLUME REVIEW EXERCISE

APPRENTICE BAKER

Carefully read the following:

DO'S:

1. Check the "course," "volume," and "form" numbers from the answer sheet address tab against the "VRE answer sheet identification number" in the righthand column of the shipping list. If numbers do not match, take action to return the answer sheet and the shipping list to ECI immediately with a note of explanation.
2. Note that numerical sequence on answer sheet alternates across from column to column.
3. Use a medium sharp #1 or #2 black lead pencil for marking answer sheet.
4. Circle the correct answer in this test booklet. After you are sure of your answers, transfer them to the answer sheet. If you *have* to change an answer on the answer sheet, be sure that the erasure is complete. Use a clean eraser. But try to avoid any erasure on the answer sheet if at all possible.
5. Take action to return entire answer sheet to ECI.
6. Keep Volume Review Exercise booklet for review and reference.
7. If *mandatorily* enrolled student, process questions or comments through your unit trainer or OJT supervisor.
   If *voluntarily* enrolled student, send questions or comments to ECI on ECI Form 17.

DON'TS:

1. Don't use answer sheets other than one furnished specifically for each review exercise.
2. Don't mark on the answer sheet except to fill in marking blocks. Double marks or excessive markings which overflow marking blocks will register as errors.
3. Don't fold, spindle, staple, tape, or mutilate the answer sheet.
4. Don't use ink or any marking other than a #1 or #2 black lead pencil.

NOTE: NUMBERED LEARNING OBJECTIVE REFERENCES ARE USED ON THE VOLUME REVIEW EXERCISE. In parenthesis after each item number on the VRE is the *Learning Objective Number* where the answer to that item can be located. When answering the items on the VRE, refer to the *Learning Objectives* indicated by these *Numbers*. The VRE results will be sent to you on a postcard which will list the *actual* VRE *items you missed*. Go to the VRE booklet and locate the *Learning Objective Numbers* for the items missed. Go to the text and carefully review the areas covered by these references. Review the entire VRE again before you take the closed-book Course Examination.

13. (011) The basic cause for accidents is

a. an unsafe act.
b. an unsafe condition.
c. unsafe acts and conditions.
d. a safe act under unsafe conditions.

14. (012) The use of unskilled workers in the bakery calls for

a. constant and alert supervision.
b. more than one shift leader.
c. accelerated training to upgrade all personnel.
d. a decrease in pastry item production.

15. (013) Most Air Force ground accident fatalities can be attributed to

a. sports and recreation.
b. industrial-type accidents.
c. unsafe operation of motor vehicles.
d. domestic-type accidents while on duty.

16. (014) Fluorescent lights should be provided with shields or clamps to

a. prevent tubes from overheating.
b. prevent tubes from falling..
c. keep dust off of tubes to prolong their life.
d. keep the tubes from being broken.

17. (014) Stacks of hazardous materials more than 15 feet high should be stacked at least

a. 18 inches from sprinkler heads.
b. 24 inches from sprinkler heads.
c. 36 inches from sprinkler heads.
d. 48 inches from sprinkler heads.

18. (015) Exhaust hoods should be cleaned frequently to prevent accumulations of

a. dust and flour.
b. any type of foreign dirt.
c. insects and rodents.
d. flammable grease.

19. (016) When lifting, the worker first makes sure that

a. there is no grease on the object making it slippery.
b. his footing is secure.
c. his path is not obstructed.
d. he is within his weight limitations.

20. (016) When two men are carrying a load, how do they coordinate their movements?

a. By using oral signals.
b. By using hand signals.
c. Their movements are automatically coordinated.
d. Their movements should be coordinated before they begin carrying the load.

21. (017) To produce fire, what three things must be present at the same time?

a. Fuel, heat, and oxygen.
b. Fuel, heat, and carbon.
c. Heat, oxygen, and carbon.
d. Oxygen, fuel, and carbon.

22. (018) When fuses are blown, the source of trouble in the circuit should be determined and corrected by

a. a qualified electrician.
b. the shift leader on duty.
c. the head shift leader.
d. the bakery supervisor.

23. (018) When it is necessary to burn small amounts of rubbish, what is the minimum distance the incinerator should be from the building?

a. 25 feet.
b. 50 feet.
c. 75 feet.
d. 100 feet.

24. (019) The first thing you should do when cleaning up the bakery is

a. not to use anything but soap and water.
b. not to use excessive water on the floor.
c. to turn off all power leads to equipment.
d. to cover up all electrical equipment as you clean.

25. (020) For the bakery kitchen, which manual gives the authority for establishing sanitation standards as well as the responsibility for their enforcement?

a. AFM 146-1.
b. AFM [illegible]-12.
c. AFM 160-46.
d. AFM 163-8.

26. (021) What is the best preventative against the spread of staphylococci bacteria?

a. Soap and water.
b. Sunlight and heat.
c. Refrigeration.
d. Ammonia.

27. (022) You must be constantly on guard against how many types of communicable diseases?

a. 2.
b. 3.
c. 4.
d. 5.

28. (022) If malaria were to break out, special measures would be initiated immediately to destroy

a. fleas.
b. rodents.
c. flies.
d. mosquitoes.

29. (023) Before a newly assigned airman is allowed to handle, process, or serve food, he must have a

a. first aid course.
b. finger culture test.
c. complete physical examination.
d. blood test only.

30. (024) The most objectionable charcteristic of an alkali is that its caustic action has a tendency to

a. dull the appearance of bakery equipment.
b. irritate and burn the skin.
c. dry on the surface of the equipment, leaving no visible signs.
d. produce very little suds.

31. (025) What is the most common type of wax used in the dining hall?

a. High gloss.
b. Water emulsion.
c. Tampico wax.
d. Self-polishing wax.

32. (026) The most common of all food-infecting insects is the

a. cockroach.
b. moth.
c. housefly.
d. beetle.

33. (027) The best way to clean mop buckets and wringers is

a. to steam them clean.
b. with hot, soapy water.
c. with ammonia.
d. to spray them with a disinfectant.

34. (027) When cleaning the vertical mixer, which of the following should be used?

a. A strong detergent and hot water.
b. A strong detergent and warm water.
c. A mild detergent and hot water.
d. A mild detergent and warm water.

35. (027) The most common sizes of steam-jacketed kettles used in the Air Force are the

a. 40- and 60-gallon sizes.
b. 20- and 40-gallon sizes.
c. 20- and 60-gallon sizes.
d. 60- and 80-gallon sizes.

36. (028) All refrigerator units should be kept clean, orderly, and

a. as dry as possible.
b. be inspected once a week.
c. have the stock rotated daily.
d. be defrosted twice a week.

37. (029) The liquid brushed on the surface of an unbaked product is called

a. wash.
b. topping.
c. covering.
d. glaze.

38. (030) The chief structure builder in cakes is

a. water.
b. flour.
c. eggs.
d. sugar.

39. (030) In yeast-raised doughs, sugar acts as a yeast

a. retarder.
b. enzyme.
c. food.
d. tenderizer.

40. (030) When brown sugar is used in place of granulated sugar in cookies and cakes, what must be added to adjust the acidity of the mix?

a. Baking soda.
b. Baking powder.
c. Syrup.
d. Cornstarch.

41. (030) Granulated sugar allows cake crust to color at lower baking temperature because it

a. reduces the caramelization point.
b. is completely dissolved.
c. softens the flour proteins.
d. tenderizes the cake pan.

42. (030) What sweetener is used to give pastry items a distinct flavor?

a. Molasses.
b. Syrup.
c. Brown sugar.
d. Honey.

43. (030) What would happen if too much salt was added to yeast-raised dough?

a. The baked item would have a pale crust.
b. The fermentation process would be retarded.
c. The dough would be heavy.
d. The dough would ferment too fast.

44. (030) Pastries made without shortening would be

a. tough and have a soapy taste.
b. tender and fall apart.
c. dry, compact, solid masses.
d. soft, mushy masses.

45. (031) When weighing items such as cinnamon, baking powder, and salt, which type of scale should you use?

a. A standard scale.
b. A sensitive scale.
c. A counterbalance scale.
d. A heavy-duty scale.

46. (032) Which of the following is <u>not</u> one of the four ways to prepare a pan for baking cakes?

a. Line the pan with paper.
b. Grease the pan with vegetable oil.
c. Line the pan with a salad oil and flour mixture.
d. Grease the pan with shortening and dust with flour.

47. (033) In the second stage of the two-stage method of mixing cake, how many minutes do you mix the cake batter?

a. 1.
b. 2.
c. 3.
d. 4.

48. (033) Before attempting to whip egg whites for an angel food cake, the bowl and whip must be

a. free of oil or grease.
b. chilled.
c. pretreated with an egg yoke coating.
d. warmed.

49. (034) At what temperature do you bake angel food cake?

a. 325° F.
b. 350° F.
c. 375° F.
d. 400° F.

50. (034) How long do you bake a 9-inch pan of devils food cake?

a. 15 to 20 minutes.
b. 25 to 30 minutes.
c. 30 to 35 minutes.
d. 40 to 45 minutes.

51. (035) Which of the following will cause a batter-type cake to be tough?

a. An excessive amount of leavening.
b. An insufficient amount of flour.
c. An excessive amount of sugar and too little water.
d. An insufficient amount of sugar, shortening, and too many eggs.

52. (035) Which of the following will cause an angel food cake to have a dark crust?

a. Improper mixing.
b. Inferior egg whites.
c. Excessive cream of tartar.
d. Excessive oven heat.

53. (036) Which of the following is not one of the three basic reasons that cakes are finished after baking?

a. Adds to the flavor.
b. Adds to eye appeal.
c. Increases the value of the cake.
d. Increases the keeping quality of the cake.

54. (037) When making cookies, what determines whether the cookies will be hard or soft?

a. The length of time they are mixed.
b. The length of time they are baked.
c. The amount of work they receive on the bench.
d. The proportion of the basic ingredients used.

55. (037) At what length is a stiff-batter cookie cut?

a. 1/2 inch.
b. 3/4 inch.
c. 1 inch.
d. 1 1/4 inches.

56. (038) Cookies should be removed from the oven when they

a. are slightly underbaked.
b. are completely baked.
c. begin to turn brown.
d. begin to get dark edges.

57. (039) Which of the following are ways to finish a cookie?

a. Garnish with sugar, nuts, or raisins.
b. Ice with different colored icing.
c. Ice with white icing and dip in colored coconut.
d. All of the above.

58. (040) If cookies lack spread, which of the following would be the cause?

a. Wrong type of sugar.
b. Baking in a cold oven.
c. Underworked dough.
d. Lack of moisture retaining ingredients.

59. (041) Which of the following is not one of the three basic types of pies?

a. Single-crust fruit pies.
b. Double-crust fruit pies.
c. Single-crust custard pies.
d. Single-crust cream pies.

60. (042) When do you add the water to a pie dough mixture?

a. With the flour.
b. After a dough is formed.
c. Before the shortening and salt are added.
d. When lumps about the size of marbles are obtained.

61. (043) For the top crust of a pie, the dough that is to be rolled by machine should weigh

a. 6 ounces.
b. 8 ounces.
c. 10 ounces.
d. 12 ounces.

62. (044) When making pastry, which of the following items do not require greased or paper lined pans?

a. Cake.
b. Fruit bars.
c. Brownies.
d. Pies.

63. (044) Why do you wash the top crust of a pie?

a. To remove excess flour.
b. To insure a golden brown color.
c. To insure that the filling does not boilout.
d. To remove any foreign particles that may have gotten on the pie.

64. (044) Why do you cut holes in the top crust of a pie?

a. To help the filling get hot fast enough to keep up with the crust.
b. So the filling does not get too hot.
c. To keep the top and bottom crust from separating and allowing the filling to run out of the pie.
d. So steam can escape from the pie filling.

65. (045) When using pregelatinized starch instead of cornstarch, pregelatinized starch will give you

a. 1 1/2 to 3 percent more filling.
b. 1 1/2 to 3 percent less filling.
c. 6 to 12 percent more filling.
d. 6 to 12 percent less filling.

66. (046) Which of the following would cause a pie to have a soggy crust?

a. Overmixing.
b. Baking in an oven that is too cool.
c. Too much shortening.
d. Baking in an oven that is too hot.

67. (046) Which of the following would cause a pie crust to lack color?

a. Inadequate oven heat.
b. Excessive oven heat.
c. Too much sugar in the mix.
d. Too little salt in the pie dough.

68. (047) When sweet dough is being mixed, what network is being developed in the dough?

a. Gliaden.
b. Gliddian.
c. Gluten.
d. Glucose.

69. (048) When does fermentation in yeast-raised doughs begin?

a. When the mix has been mixed.
b. When the yeast is added to the mix.
c. When the dough is placed in the oven.
d. When the dough temperature reaches 92°.

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70. (048) Which of the following types of fermentation is the most desirable?

a. Butyric.
b. Lactic.
c. Acetic.
d. Alcoholic.

71. (049) When you are testing a dough for punching and the dough around the depression falls rapidly, what does this mean?

a. The time for punching has passed.
b. Too much air was incorporated in the mixing process.
c. The dough is too slack.
d. Too much yeast in the dough.

72. (050) For the makeup of cinnamon rolls, the dough should be cut into pieces weighing

a. 4 1/2 pounds.
b. 5 pounds.
c. 6 pounds.
d. 6 1/2 pounds.

73. (051) What should the humidity in the proofing cabinet be?

a. 60 to 65 percent.
b. 70 to 75 percent.
c. 80 to 85 percent.
d. 90 to 95 percent.

74. (052) Too much salt will cause a yeast-raised dough to

a. lack volume.
b. have too much volume.
c. have an acid or flat taste.
d. be tough.

75. (053) If you are checking subsistence in the storeroom, refrigerator, and freezer for spoilage, what type of inspection are you conducting?

a. Condition.
b. Quality.
c. Inventory.
d. Quantity.

76. (053) The contents of a can are considered spoiled when the

a. top of the can is rusty.
b. bottom of the can is rusty.
c. rust has penetrated the interior.
d. sides of the can are rusty.

77. (054) What are the ideal storage conditions for nonperishable supplies?

a. A warm, well ventilated area.
b. A cool, dry, clean, well ventilated area.
c. A damp area without ventilation.
d. A cold, well ventilated area.

78. (055) If 1/4-inch or more of frost collects on a refrigerating unit, it will

a. cool the unit and help the motor.
b. retard the cooling process.
c. keep the moisture at the required level.
d. reduce the possibility of freezing the unit.

79. (055) You must clean the refrigerator space

a. daily.
b. once a week.
c. twice a week.
d. every ten working days.